

COAL AGE

Vol. 6

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Vol. 25

“Eng-
land was
merry England
when Old Christmas
brought his sports again.
A Christmas gambol
oft could cheer the poor
man’s heart through half a year.”
That was Walter Scott’s idea of the
old time Christmas. “Cheer the poor
man’s heart through half a year.” That’s
the kind of Christmas we need this year.
With men out of work, and almost un-
heard-of conditions in the coal trade; with
coal-mining companies on the verge of bank-
ruptcy; yes, we need a Christmas that will help.
“Easier said than done,” you say. Sure, but the
point is, let’s do it. Christmas is peculiarly a cele-
bration for the children; it’s children’s work to get
down to the very bottom of discouraged men’s hearts
and make them forget all about their troubles; and
they do it without realizing that they have accomplished
anything. Put the children to work. But wait—first
remember that many a child is troubled now and griev-
ously troubled; don’t let that keep you long, however;
just establish a new road to Santa Claus’ house, the old one
has been lost this year, and too many children have been told
about the lost trail. English and German, French and Russian,
Pole and Hungarian; they are all in our midst and their hearts are
heavy just now thinking of their bleeding kin across the sea. But
nations have passed through sorrow before and also want; Christmas
reaches back through many such experiences. It had a mission then
and has a mission now. The children hold the key. It is only
necessary to lend them material encouragement. Let every coal-
mining community in America arrange for the biggest “doings”
this Christmas that have ever taken place. The
joy of the youngsters will radiate and per-
meate
through
every
home,
and the heavy hearts of the grown-
ups will be warmed with gladness.

Ideas and Suggestions

Mining Publicity

In connection with the discussion that has been carried on of late through the public press in regard to the present condition of the coal trade, one item, at least, has been overlooked, that is, the item of publicity insofar as it affects the education of the general public that buys the coal. Is such education necessary? Many believe that it is, because there is a very general misconception in regard to the coal business.

It has been widely stated by those engaged in mining and handling coal that very little money is being made in the business and that no similar industry in the United States of equal importance receives so small a return on the capital invested and for the risk run, both by the operator and miner. The public as a whole does not believe this, and therefore, very naturally does not take kindly to the proposition to increase its fuel bill, for every one, corporation or individual, wants to get the greatest amount for the least possible outlay.

The idea is entirely too prevalent that the coal producers are trying to put one over on the public when they ask for an increased price for their product, while it is undoubtedly true that great fortunes have been made out of coal mining and while others will be, undoubtedly, in the future, the competitive conditions under which the business is now being carried on are not understood by most of those who buy coal, nor even by many of the financial centers where the coal industry has been capitalized.

Would a better understanding between the buyer and the seller in regard to just what it costs to produce a ton of coal remedy the present unsatisfactory conditions? The present hand-to-mouth policy under which so many coal operations are now being carried on cannot continue indefinitely.

COAL MINING AND THE DAILY PAPERS

Why is it that the metropolitan daily papers give so little attention to the mining business, excepting the purely speculative features and these often only by a few of the distinctly financial journals? The latest divorcee in Chicago or New York gets ten times the space in the daily paper that the failure of a coal company involving millions does. The public wants scandal, do you say; very true, but the coal companies should want and demand publicity.

Why do the agricultural interests obtain immediate attention from a legislature? Because by consistent publicity the general public, which includes legislators, has been made to think that the farmers are the greatest people on earth and that they should have everything they ask for. No one would for a moment attempt to deny the importance of the agricultural interests, but the mining industry should copy some of the publicity methods of the agriculturists and if this is done, there will not be the great differences that now exist between the appropriations made by the national and state governments for the benefit of the two industries, and legislation that tends

to place mining upon a more stable basis will not be tabooed as it now is. An industry that furnishes fifty per cent of the freight of the country has a right to be heard and to have its true story known.

If the real nature of coal mining were better known and the importance of the industry better appreciated, remedial legislation in states in which coal mining is upon a competitive basis would be more easily obtainable.

NEED FOR UNIFORM LAWS

Safety-first legislation is very desirable, but is it fair to compel the operator in one state to use measures that materially increase his costs, while his neighbor working under practically identical conditions and shipping to the same market, is practically granted a bonus upon his coal through lack of such safety legislation? Public opinion should be made to understand the differences, so that it may compel state legislatures to give equal protection to all, for unless this is done Federal control is inevitable in order to equalize the burdens upon the industry.

People as a whole are fair-minded and if they are made to understand that the present difference between the cost of mining a ton of coal and the selling price does not give a suitable return upon the enormous capital invested, they will be willing, we believe, to grant an increase, so that the miner can receive the fullest possible protection and the operator secure a just return upon his investment.

Very little has been done in this country to let the people in general know just how mining is carried on. In Europe and particularly in Germany every effort is made to teach the public about industrial undertakings. In Berlin and Munich, for instance, though comparatively remote from the mines, there are magnificent mining museums open at stated intervals to the general public and in which are exhibited all kinds of mining machinery, both separately and in combination, as, for instance, working mine tipples that show the elaborate processes of preparing coal. Methods of mining are well shown in models and every detail almost of the operation of a mine is so strikingly illustrated that the ordinary layman may understand the difficulties of the business.

MUSEUMS AS PUBLICITY AGENTS

America has thus far provided no such museums excepting through the world's expositions and through the small collections of mine models exhibited at some of the mining schools. Some of the models from the expositions have been collected in Washington, but a single museum in the capitol can only do a small part of the work of popularizing the coal business. Models and museums are mentioned not as the "cure" but as representing one phase of the cure and as one medium of publicity. Cooperation of the buying public may possibly be secured if some of the supposed secrets of the business are given out.

The uncertainty of the application or misapplication of

the Sherman law and similar legislation has naturally made the operator timid about giving too much information to the public. Even when it is not wise to give out costs, information in regard to the difficulties of operation and the many processes involved in the mining and preparation of coal can be given out without fear of giving away trade secrets or putting dangerous information into the hands of pestiferous government agents. Such companies as the H. C. Frick Coke Co. and other subsidiaries of the U. S. Steel Corporation, and the Peabody Coal Co. of Chicago have started the publicity ball rolling by presenting through the medium of moving pictures many of the operations about modern coal mines.

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The Folly of Imitation

BY I. C. PARFITT*

What are you? Miner, fireboss, foreman or superintendent? Are you yourself, or are you the caricature of the man higher up? Whatever position you aspire to in the mining world, if you be the possessor of good red corpuscles, you have an ideal of what the position is, what it requires, and what you should be to fill it.

Are you preparing yourself for the responsibilities and dignity of that position by a judicious or an injudicious adoption of the methods and mannerisms of a present or former incumbent, or by the cultivation of your individual faculties and character in conformity with your ideal? Are you dependent for the required qualifications upon imitation, or are you independent by acquisition?

When the position is attained, will you grace it by an honorable individuality or disgrace it by an affected personality?

Emulation is an honorable and praiseworthy ambition; imitation is a despicable one.

Two of the most powerful factors to success are *concentration* and *application*. They are not characteristic of any particular individual, but may become common attributes; they may not be possessed by every individual to the same degree in the same vocation, but they may be possessed in the highest degree by every individual in the vocation for which he has a predilection. The cultivation of these faculties develops individuality. The aping of the manners and peculiarities of another not only destroys individuality but excites derision and contempt.

Analyze them and see if the qualities you admire in others are not those which, by cultivation, you may possess yourself.

Are you imitating the peculiarities of the "man higher up"? Cut it out; you may awake to the fact that you have been worshipping false gods.

Get the habit of studying yourself and your moral relations to your fellowman.

Imitators never make any progress themselves and never confer any blessings upon the world.

If you have the ambition to get higher up, study the nature of the position and yourself; bring about a conformity; don't dress up in the other fellow's clothes, the asininity might be revealed by the bray.

Be an efficient man in the position you hold. Efficiency in a subordinate position is the best recommendation for advancement to a higher one, whether it be recognized as such or not. If you have learned how to command

the respect of your fellow miners you have learned how to command respect in any position to which you may aspire.

Respect is not secured through arrogance, superciliousness, officiousness or exclusiveness, but by the individuality acquired through the commercialism of mutual recognition.

Position will not give dignity to a man, but a man may confer dignity upon any position.

Don't imitate. Emulate, and cultivate the individuality of Truth and Right.

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Better Things to Come

BY F. S. JOHNSON*

The truest index of an individual's or of a nation's sanity is the ease with which they endure and then forget extreme hardships, and in the degree of firmness with which they maintain their grip upon things in general in times of stress.

So as we draw near to the close of 1914 and pause to recount the experiences that have come to us since its beginning, let us pay to it the tribute usually accorded the dying, by looking longest upon the best it has given us, and forgetting—save the benefits derived therefrom—the hardships endured.

To the coal men of America the passing year has brought its full quota of trying situations. But be it remembered that this year has also witnessed one of the greatest advancements in first aid, safety-first and general-welfare movements that the country has ever known. This fact reflects credit upon those men who have been able to hold fast to their ideals and accomplish so much toward their realization, amid such adverse conditions.

It is one of the blessings of human nature that misfortunes when viewed in retrospect lose much of their bitterness, and, if considered at sufficient length, always present some feature that has added materially to one's welfare.

Therefore, the very things that have appeared to conspire against the coal industry this year, such as the long drawn-out deliberations of the Interstate Commerce Commission, unreasonable state legislation, unsettled labor conditions and the paralyzing effect of the European war upon trade, have at the same time taught valuable lessons, and left as a reward, in the breast of every man who has performed his duty faithfully, an increased measure of self-confidence, a broader knowledge of his business and its powers of endurance, and a keener appreciation of the responsibilities devolving upon him.

With the dawn of 1915, there will come to the doors of the United States the loud rappings of opportunity, and to the men engaged in the coal industry, which forms the bone and sinew of our natural resources, will be given the unprecedented privilege of arising to their fullest efficiency, and of applying to the new conditions which will prevail, the principles drawn from the important lessons that have been learned during the past 12 months.

So as we stand on the threshold of another year, let every man look backward with the satisfaction that comes from the consciousness of a duty well done; and forward, with a confidence and sense of preparedness for what is to come, with an energy that will prove to the world the sanity of the coal-mining fraternity of America.

*Jerome, Penn.

*Coalton, W. Va.

beams, 23.8 lb. per foot, instead of the I-beams, and so far better results are being obtained.

Where wood is subject to dry rot the use of steel timber has been very successful, but where there is a constant squeezing or heaving it has been found inadvisable to substitute steel for wood. A considerable saving in the maintenance of timbering has been made up to this time by the use of steel, and its use is being extended.

All turnouts and permanent openings, where timber-

steel will be fully 100 per cent. A turnout which had to be retimbered every nine months at a cost of \$20 per set for labor and material is a notable instance of the greater economy of steel timber as compared with wood. Steel timbering costing \$40 per set for labor and material was installed four years ago, and will last many years yet. It will be seen that the saving amounts to more than \$60 per set to the present time.

We use practically all peeled timber, although at times

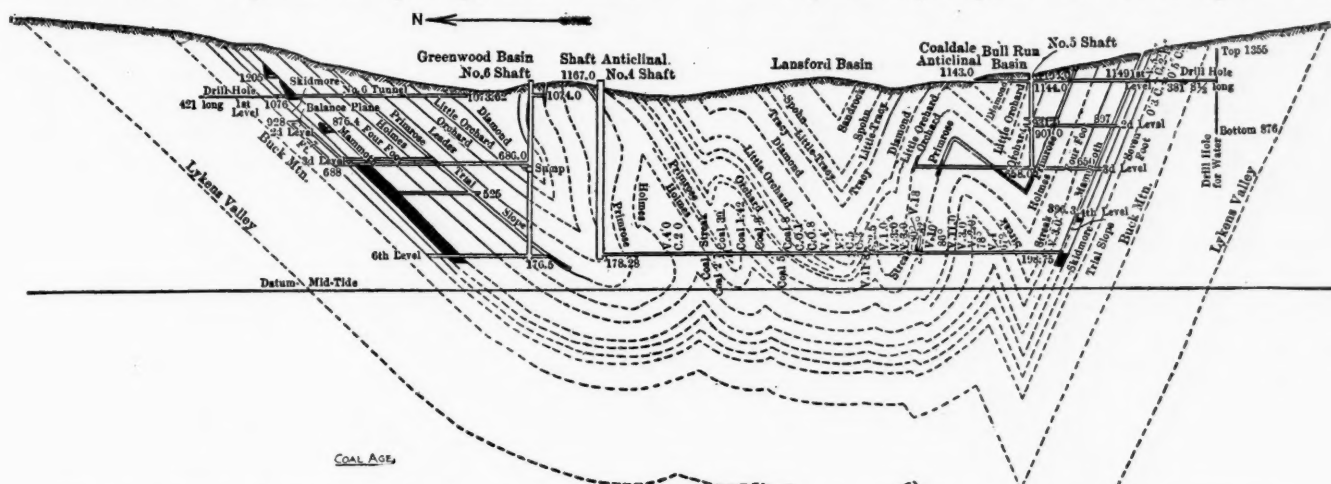


FIG. 2. CROSS-SECTION THROUGH PANTHER CREEK VALLEY ON LINE OF NOS. 4, 5 AND 6 SHAFTS

ing is necessary, are being timbered with steel, and sections of various sizes up to 70 lb. per foot are used, according to the requirements. I cannot state at this time what the average life of a set of steel timber in a gangway will be, but the material will probably last at least 10 years.

we are unable to procure it. We have not used treated timber in the mines, although some of the other anthracite companies have experimented rather extensively with it for a number of years at one or two of their collieries. We are testing steel timbering instead of wood in a few of our main chutes, those which will have to be held open

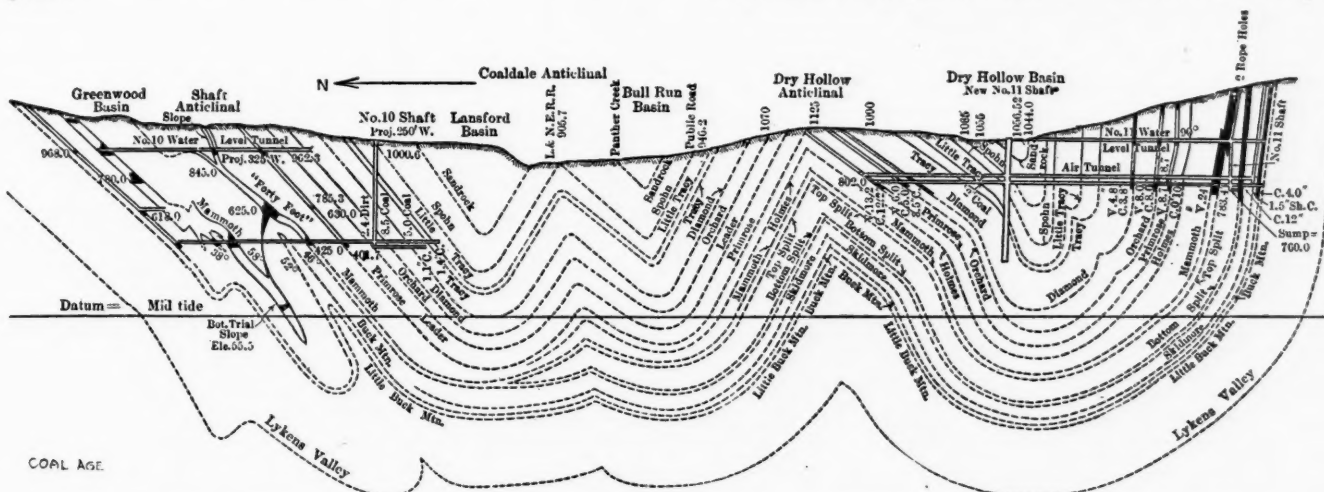


FIG. 3. CROSS-SECTION THROUGH PANTHER CREEK VALLEY AT GREENWOOD AND RAHN COLLIERIES ON LINE OF NOS. 10 AND 11 SHAFTS

The average life of wooden timber in a gangway is three years. In many instances wooden timber has lasted 15, and in many others it has lasted less than one year, depending entirely upon the physical conditions. There are also many instances where it was almost physically impossible to hold open certain stretches of gangways and airways until steel timber was installed.

STEEL IS CLEARLY HALF AS COSTLY AS WOOD WHEN LIFE IS CONSIDERED

Figuring the average life of wooden timber as three years, and of steel timber as 10, the saving made by using

for five or six years, and we believe that the use of steel will result in a saving.

LOCATION OF GANGWAYS

The proper position of gangways and airways with reference to the top and bottom rocks is sometimes a question. In veins pitching from 60 deg. to vertical the gangways and airways are driven along the top rock, for the reason that the loading chutes, on about 30 deg. pitch, can be driven back from the top rock to the bottom rock. In this way a safe working place is provided for loaders, and the loose coal can also be controlled. In veins

with lesser pitches the gangways are driven on the bottom rock and the airway along the top rock.

The distance between a gangway and its airway, when both are driven along the same rock, varies according to conditions. Years ago the distance varied from 20 to 30 ft., while during the last few years it has been found advantageous in some cases to increase this distance to 50 ft. in the sections where the chutes were driven on 60-ft. centers, as it results in lowering the maintenance cost of the gangways.

FROM GANGWAY TO BOTTOM-BREAST CROSSCUT

The method of opening a breast is as follows (see Figs. 4 and 5): Chutes, 6x6 ft., partitioned off to make a traveling way and a loading chute, are driven from the

where a connection is made. Thus is formed what is called a "stump" above the battery. The breast is now 18 ft. wide between the manways.

A length of manway is put in on top of the dog hole and the first cut-back is made in the following manner: The top of the dog hole forms the bottom of the cut-back; manways are carried on both sides and the coal is blasted 18 ft. wide between the manways and 10 ft. high all the way back to the top rock of the vein.

After the first cut-back has been completed the breast is driven 30 ft. farther up the pitch, where the second cut-back is made. The second and additional cut-backs are similar to the first. Where the pitch of the vein is 45 deg., for instance, the loose coal does not fill the whole space made. In this case the miners carry a "path" along each

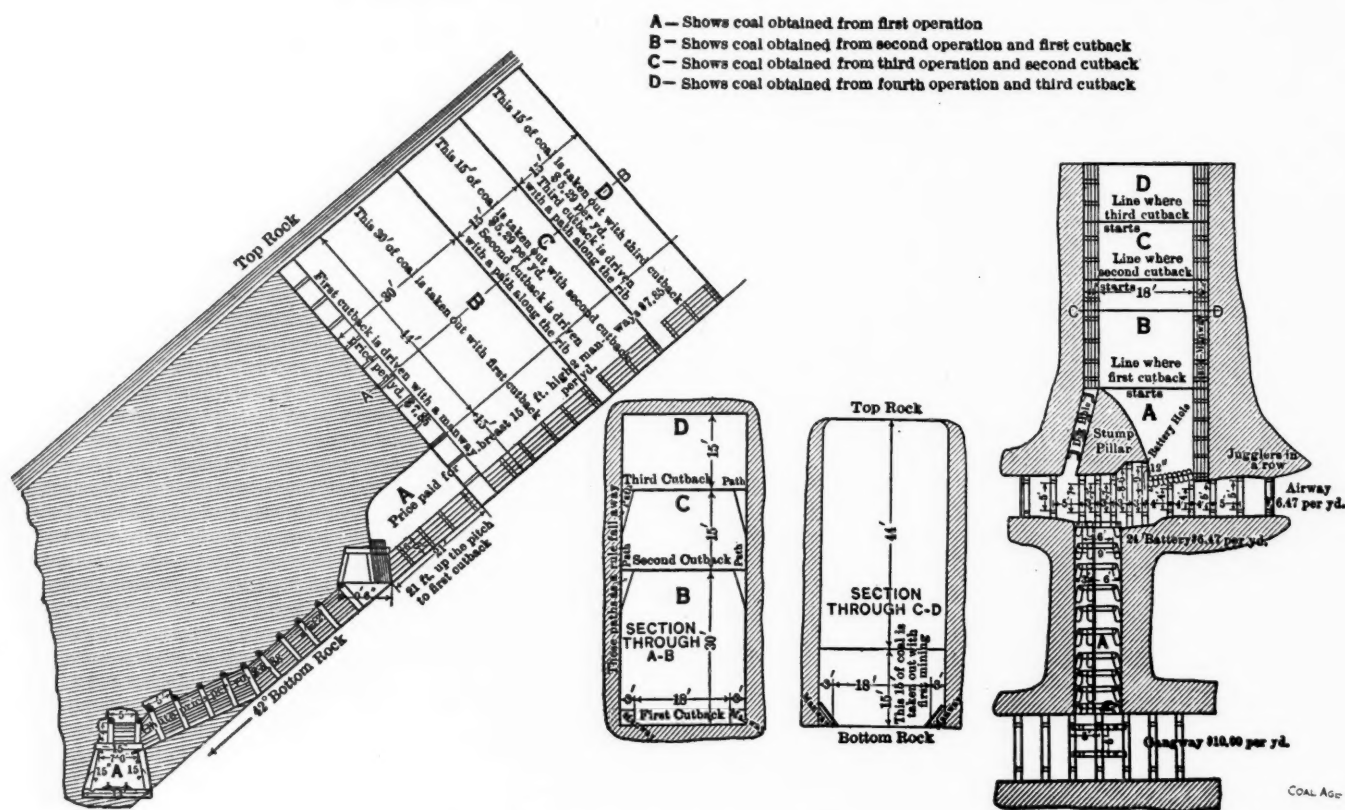


FIG. 4. CUT-BACK IN NO. 62 BREAST, EAST MAMMOTH VEIN, NO. 10 SHAFT

gangway on a pitch of 22 deg. until the bottom rock is met. They are then extended up the pitch of the bottom rock, to the height at which it has been decided to have the stump heading or bottom-breast crosscut. At this point a juggler battery is put in and a 4x6-ft. crosscut is driven connecting the top of the chute with the top of the next chute. This crosscut is used for ventilating and travel, and is locally known as the "bottom-breast crosscut."

THE BREAST PROPER AND ITS FREQUENT NORMAL DEVELOPMENTS TERMED "CUT-BACKS"

In forming a breast, the "front" manway or dog hole is driven on one side 20 ft. up the pitch, and a back manway carried on the other side; both these are opened off the bottom-breast crosscut. The opening between the back manway and the battery collar is 10 ft. wide and 8 ft. high, and this opening is carried up the pitch and gradually widened until it reaches the top of the dog hole,

rib of the cut-back. Two miners blast the coal, each traveling his own path, until the top rock is reached and all the coal is taken out between the first and second cut-backs.

The breast is again driven up the pitch 15 ft., where the third cut-back is made in the same way as the second. If the breast does not run away, or the top coal does not fall, a cut-back is made every 15 ft. up to the old level. In steep pitching veins no paths are necessary, the miners standing on the loose coal to make the cut-backs.

WHEN THE BREAST RUNS AWAY

It frequently happens that the breast runs away after the second or third cut-back is made, in which case a chute is driven along the back manway of the breast to a point about 30 or 40 ft. above the face, a battery is put in, and another breast is driven similar to the one just described. If this breast runs away, the chute is carried farther up the pitch past the face of the runaway breast

and another breast opened, probably reaching the old level.

At one colliery where the vein is practically vertical and the breasts are driven along the bottom rock, the manways are driven along the top rock, and this has been found of great assistance, because the manways are not so liable to become blocked by falls, thus interfering with the ventilation of the breast.

ANOTHER METHOD MADE NECESSARY BY SPLIT SEAM

The driving of breasts as I have just described is the common practice, but where the vein is divided into its various splits, a different method is used. At the Tamaqua colliery there are a bottom and a middle split, the parting slate being from 12 to 18 ft. thick. The bottom

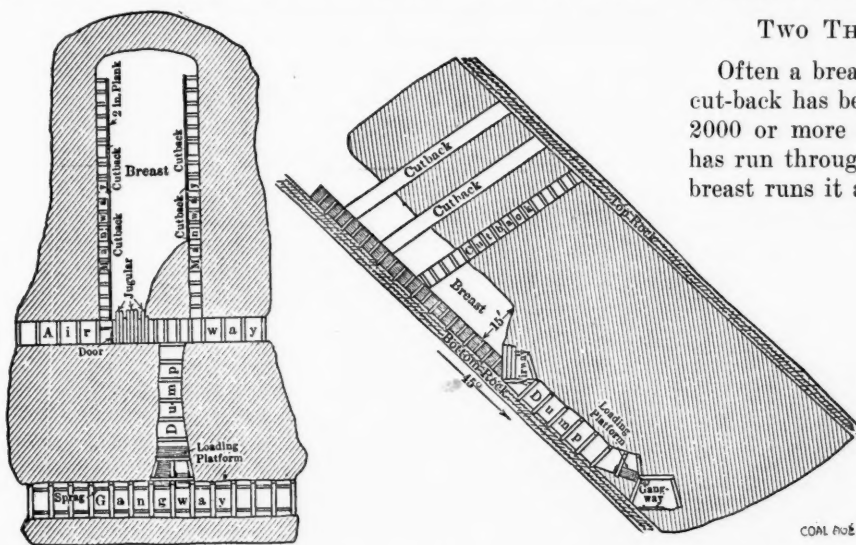


FIG. 5. METHOD OF WORKING MAMMOTH VEIN, LOWER LEVEL, COLLIERY NO. 8

split is 7 ft. thick and the middle split 4½ ft. The gangway is driven in the bottom split, as is also the airway. 40 ft. above.

Rock holes, 50-ft. centers, are driven from the bottom-split airway to the middle split. The middle split is mined by breasts 8 yd. wide, and robbed by skipping the pillars, beginning at the top. After the completion of the robbing, the bottom split is mined in the same way directly underneath the middle-split breasts. The cost of coal mined by this method is high because two breasts have to be driven for 12 ft. of fuel thickness.

It was originally planned to use the breast method in the middle split and the chute method in the bottom split; the chutes being driven while the breast was being worked. Care was taken, however, not to commence the robbing at the top of the chutes in the bottom split until it had been completed at the top of the breast in the middle split.

It was found that as soon as the pillars were cut in the middle split there was so much squeezing and heaving in the chutes in the bottom split that it was almost impossible to hold them open, and the plan had to be abandoned. At the present time, breasts are being driven in both splits satisfactorily, except that the cost is high.

BREASTS ARE NOW NARROWER AND PILLARS WIDER

Many years ago breasts were driven 10, 12 and 20 yd. wide, and in the old Rhume Run tunnel of Nesquehoning

colliery some were even as wide as 30 yd. At the present time breasts are driven 8 yd. wide, and where the vein is free the width is not permitted to exceed 6 yd. I think it is safe to say that about 40 per cent. of these breasts are of this latter width.

As the width of breasts has decreased, the size of the pillars between breasts has increased. For instance, where 12-yd. breasts were driven on 50-ft. centers, the pillars were 14 ft. wide. At the present time 6-yd. breasts driven on 50-ft. centers give a width of pillar of 32 ft.

In thick veins breast work is preferable to chute work, especially where there is a good supply of air. The amount of blasting necessary is much less, and consequently the yield of prepared sizes is larger, for after the first cut-back has been made there is a loose end.

TWO THOUSAND CARS OF SELFMINED COAL

Often a breast will run away after the second or third cut-back has been made, or sooner if the vein is soft, and 2000 or more cars will be loaded out before the breast has run through to the old lift above. However, when a breast runs it always fills with gas, and so remains until it has run through to the old workings. Great care must be taken, under such circumstances, to avoid explosions.

In chute mining in new ground the chutes are driven almost to the old lift above, and as soon as the upper section of the vein has been worked and breaks through to the old workings there is not much further trouble with gas.

The coal is mined by driving chutes back toward the top rock, where breasts are driven first along the top rock, and later up the pitch. Retreat is made down the main chute for 30 to 50 ft. and another chute driven to the top rock, and the operation repeated. This method is carried on until the chute has been robbed down.

BREAST METHOD CHEAPER BUT MORE WASTEFUL

All the coal has to be blasted, as heavy falls cannot be expected because of the shortness of the sections, and also because there are no loose ends. The maintenance cost of the chutes is high. The result of a test made at one colliery from 1907 to 1909 showed that the breast method cost only 60 per cent. as much as the chute method. However, the recovery by the former was only 92 per cent. as much as by the latter.

VARIOUS PILLAR-DRAWING METHODS

The most important question in mining, especially insofar as the ultimate yield of the vein is concerned, is the robbing of the pillars. In the early mining, the practice was to cut the pillars at the bottom of the breast by stripping a slice off the pillar at the top of the dog hole and bearing into and cutting it through if possible. The pillar was followed up the pitch until it became dangerous to go any farther, or until the gob from the old breasts rushed in. By this method a large percentage of the pillar was left standing, as the heavy rock from the breast would soon rush in and the place would be abandoned.

A later method was, to drive a chute in the center of the pillar some distance up the pitch, where the pillar was

cut through from the rib of one breast to the rib of the other. A larger percentage of coal was obtained by this method, but it was soon found that the maintenance cost was high, due to the squeezing of the pillars, although it was more successful on the slighter than on the heavier pitches. On the heavy pitch, the coal and rock coming down the chute knocked the timber out, causing heavy maintenance charges.

Another former method was to couple up the old manways of the breasts on each side of the pillar and put in a battery, the old breasts being left full of coal. The bottom benches were taken out between the manways and were cut back in the middle of the pillar toward the top rock, care being taken to leave a small pillar on each side above the old manways which had been coupled, in order not to break them.

After these pillar breasts had been driven up to the same height as the face of the old breasts, loading was commenced from the three batteries, trusting that the small pillars over the manways would crush, and all the coal would be won. This method was found objectionable, as the pillars squeezed so much that it became too dangerous for men to continue to work, and they were seldom able to drive the pillar breast as far as the face of the old breast.

Experiments were then made with the chute method of robbing pillars. These chutes were driven about 25 ft. apart and to within 30 ft. of the old level above, and robbing commenced at the top. It was first thought that by this method it would be easier to reach the coal between the chutes; however, it was soon noticed that so many openings caused such a general squeezing in the chutes that it was almost impossible to keep them open, and in fact, many of them were lost. This distance between centers was then increased to 50 ft., and later to 60 ft. The main chutes were connected up by slant chutes, which were used for ventilation and later for robbing the various blocks of coal in the pillar. This method is the present practice.

A Modern Coal-Handling Machine

A contract has been awarded by the receivers of the Cincinnati, Hamilton & Dayton R.R. for the construction of a modern coal-unloading machine at Toledo, Ohio, which will cost about \$350,000 and provide additional facilities for handling the road's coal traffic consigned for trans-lake shipment. The capacity of the new machine will be 40 cars an hour, and, replacing the present unloader, the capacity of the terminal will be 3,000,000 tons a season.

The steelwork will be fabricated and erected by the Wellman-Seaver-Morgan Company, Cleveland, and the foundations will be built by the Smith-McCormick Company, Easton, Penn. Work on the improvement will be started at once and must be completed, under the contract by April 27, 1915, in order to be ready for the opening of lake navigation. A feature of the new machine is that its operation will entail but a 3-ft. vertical lift, thus overcoming breakage to a large extent.

During the season recently closed a new record was established by the Cincinnati, Hamilton & Dayton R.R. when 2,000,020 tons were handled over the docks at Toledo.

Extracts from a Superintendent's Diary

Undoubtedly, we are soon to have another strike; it's in the air.

The pit committee finds something to wrangle about every day. Many little contentions hardly worth considering have suddenly become "crying wrongs" that must be righted.

Some of our foremen have been inclined in the past to yield a point here and a point there to the committee rather than waste valuable time in compelling them to live up to the spirit of their contract in little things. And now the committee is attempting to fall back upon some of these concessions, trying to force them down our throats.

The indications are that the strike is not to be local, but will affect the entire state. Some of our men who are known as good organizers are becoming very irregular about reporting for work, missing just as many days as they possibly can, without being subject to discharge according to contract, and are probably assisting to bolster up the Union organization in camps where the men are not manifesting sufficient enthusiasm.

The miners' checkweighman on our tippie has suddenly become the village wiseacre. He is literally surcharged with recollections of how we have been gouging the men on weights in spite of all his watchfulness, but he insists that it won't be possible to hoodwink him any longer, and he is proving it to the men constantly, much to the disgust of our regular tally boss, who is helpless in the matter, by stopping and starting loaded and empty cars on the scale platform in a most absurd manner, thus delaying the operations at this point unnecessarily.

We have had an understanding that required a quarterly test to be made of the tare weight to be used for the cars. Lately, we have made two special tests at the request of the checkweighman, but he is still not satisfied. It always happens that a few of the cars are missed by the men in spite of being cautioned to go into every room of the mine for the sole purpose of seeing that every empty car does get to the top; the checkweighman insists that he will not be satisfied until every car is actually brought to the scales.

As a sort of feeler, to find out just how complete is the influence of the union officials on our men, last week we gave the president of our local a chance to show his hand, and he promptly embraced the opportunity.

It happened that the said president was driving a heading that reached its limit and notwithstanding the fact that the heading just completed has been the most desirable working place in the mine for several years, we insisted that the president must take the next heading to be turned, which as it happens will be a most undesirable one because of low coal and bad top. We assured him that we regretted having to make the change, but it wouldn't do "to play favorites" (a phrase we appropriated from the president's last speech to his local). He said nothing but left the foreman's office with lowering brow.

Within two days he stirred up a hornet's nest, by suggesting a new interpretation to an old rule about extra pay for low coal and bad top when found simultaneously in an entry, and all our men are clamoring now for an adjustment in rates on this class of headings, which, if granted, will compel us to abandon that part of the mine.

Yes, undoubtedly a strike is on the way.

Concrete Lining for Steel Bunkers

When building its new plant at Duluth, Minn., the Minnesota Steel Co. also built a large circular steel tank (Fig. 1) for supplying coal to the coke plant. This tank is approximately 55 ft. in diameter, 40 ft. high and holds 2100 tons of coal. For furnishing coal for the gas producers of the openhearth furnaces there are 33 bunkers, each approximately 20 ft. wide, 12 ft. deep and 17 ft. long.

To protect these bunkers from the corrosive action of the coal, it was decided to cover the coke-oven bins with a 5-in. lining and the producer bins with a 2-in. lining of concrete, using a cement gun.

Fig. 2 shows the workmen on the inside of the round tank in the process of depositing the gunite lining. Fig. 3 is a view looking from the top into a line of parabolic bunkers after the work of gunite lining had been finished.

Numerous iron lugs were placed around the inside of the tank. To the lugs vertical rods were wired, and to the rods triangular-mesh wire cloth was secured in horizontal bands. The wire mesh was held approximately $\frac{3}{4}$ in. away from the steel and gunite was then applied. The first layer is shot through the mesh and serves to hold the wire cloth in place, thoroughly covering and protecting the steel plate. The second layer is then applied, bringing it to a total thickness of 5 in. When the work is finished the concrete is monolithic in construction and the surface is smooth and even.

The cement mortar consists of a mixture of portland cement and torpedo sand in the proportion of 1 to 3, mixed dry. It is then shot through a hose by the cement gun having an air pressure of from 40 to 60 lb. Immediately before emerging from the nozzle, the dry mixture is hydrated, the water coming through a separate and smaller hose and being under the control of the operator.

The sand in the first mixture strikes a hard surface, like a steel plate, rebounds, then falls clear of the work to the bottom in the form of clean sand and leaves a

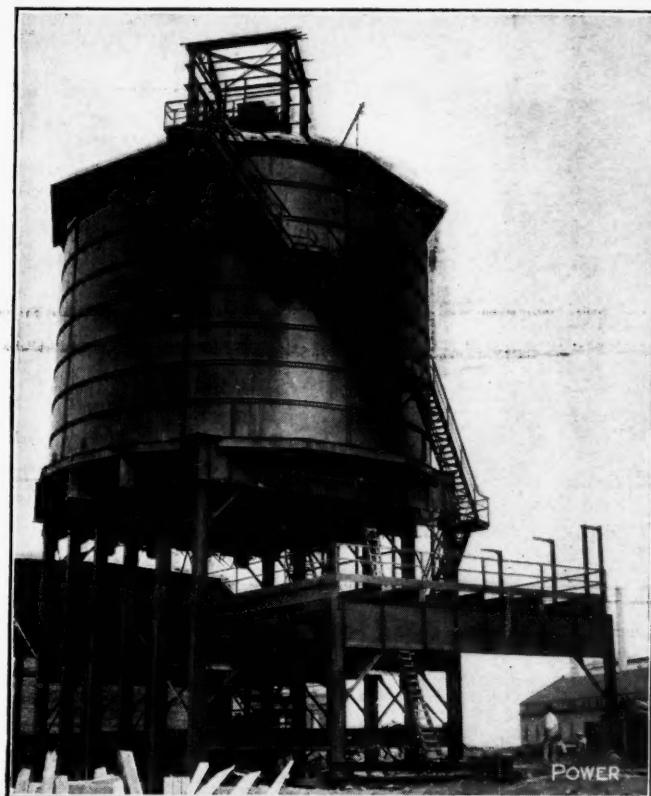


FIG. 1. A 2100-TON CAPACITY COAL BUNKER LINED WITH GUNITE

coating of cement on the surface. As soon as this coating has attained an appreciable thickness, it acts as a matrix into which subsequent deposits of material embed themselves so that the gunite in contact with the steel plate is clean cement. As a result of this, and of the pressure under which it is applied, the adhesion of the gunite to the flat steel plate runs as high as 500 lb. per sq. in.

This work was executed by the Gun-crete Co., 914 So. Michigan Ave., Chicago, Ill.

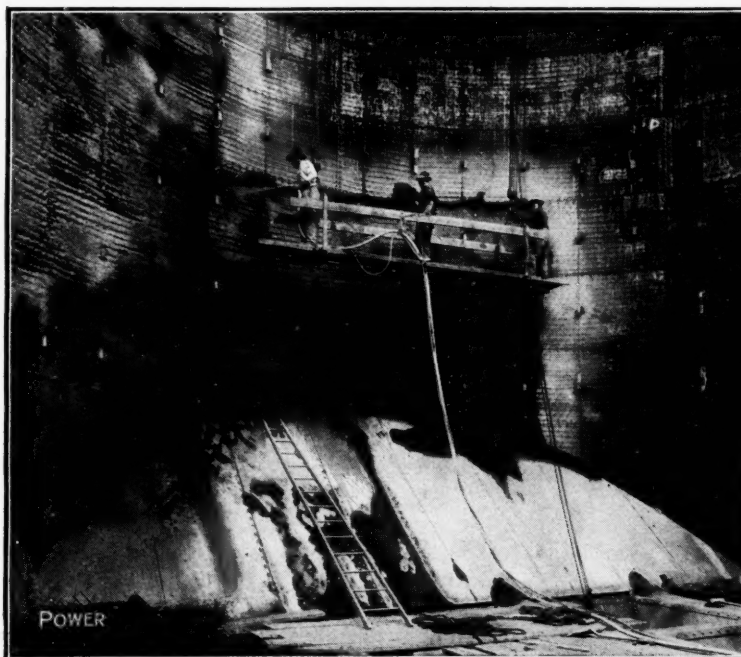


FIG. 2. PROCESS OF LINING A COAL BUNKER WITH GUNITE

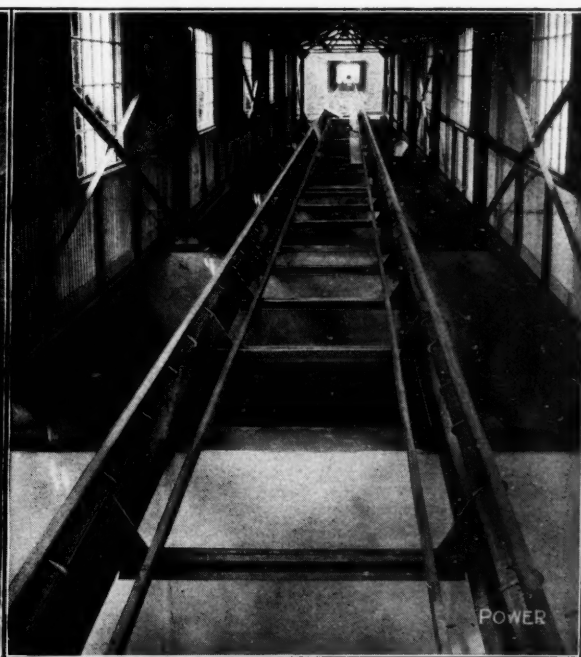


FIG. 3. FINISHED INTERIOR OF COAL BUNKER LINED WITH GUNITE

The Last Stand of the Mine Roof

BY R. DAWSON HALL

SYNOPSIS—An explanation of the thrusts of the roof. These could not exist if the roof was always a true beam or plate. The significance of an arch theory of roof structure, the conditions which make for localization of strain and for an unequal balance of stress, the causes of horizontal shear and the reasons for ultimate collapse are explained.

Some phenomena which at first puzzle us considerably, after a while fail to interest us at all. Such a phenomenon is "the last stand of the mine roof." We remember when we first entered a mine and heard the roof crack way up above our heads. Reasoning from analogy, we thought that the roof was ready to fall, just as an overloaded beam will when it begins to crack and split. But to our surprise the roof took on a new lease of life. Silence succeeded the ominous rending of the rock; a few props perhaps bent a little, or even broke, but the roof stayed up, silent and apparently unchanged. We have seen it so often that we have ceased to question why.

I have wearied you already by the analogy between the mine roof and a beam or plate and showed how it broke over the support on its upper surface and between the supports on its lower surface. But this is not the whole story, for a roof is by no means ready to fall in its entirety when fractured, even if those fractures reach from the workings to the surface.

THE BEAM METAMORPHOSES TO AN ARCH

Let us suppose, as in Fig. 1, that two areas of coal have been extracted, two ranges of rooms with their pillars on either side of a double entry. The result has been a break over the solid coal ahead of the ranges of rooms at *CC* and *DD* and another *EE* over the chain pillar. The roof is also split on the underside in the mid-span of each range of rooms as *FF* and *GG*. I have represented these breaks on the underside by dotted lines in the plan.

The huge blocks into which the roof is thus divided rest with their edges on the faces of the solid coal and on the flanks of the entry pillar. They promptly begin to fall forward and downward toward the open spaces, but as they do so they revolve and crowd one another as shown in the diagrammatic cross section at *F* and *G*.

The immediate effect is most harmful to the pillars. The expression generally used to express the ominous change is that the roof is "throwing her weight." Before breakage, the roof was bent into a saddle shape over the center pillar. It now tries to teeter on the edge and the change is not for the good of the room stumps. On the whole, the heart of the chain pillar is helped, but as it is customary not to have the headings anywhere near the heart of the pillar, the entries usually suffer severely and often close entirely.

The change which takes place when the roof first fractures replaces continuous beams or plates by disconnected arches or vaults. Let us now ask what constitutes a true arch or vault. It has nothing to do from a structural

point of view with the form of the opening. That is really only incidental.

An arch is a structure where the stresses due to the weight combine with horizontal thrusts so that support is secured without bending-moment strain. In fact, an arch cannot exist so long as a structure is so constituted that its bending-moment strains are adequate to the support of the load. The arch may consist as in the example before you of two solid blocks only, wedged firmly into place by other blocks which may or may not form parts of other arches.

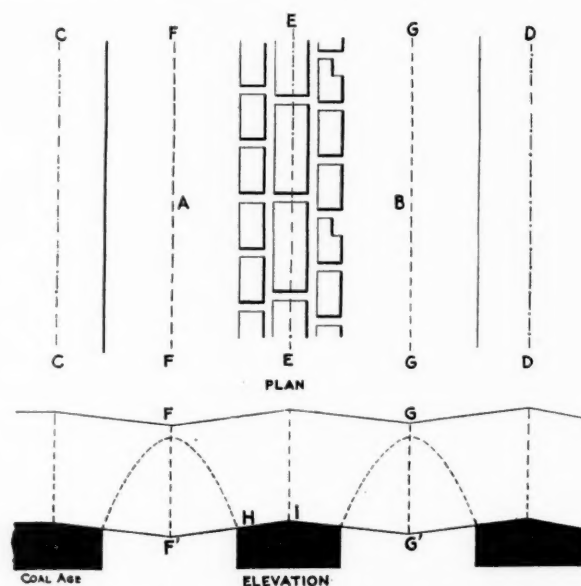


FIG. 1. EXHIBITING ARCH ACTION WHERE COAL HAS BEEN REMOVED FROM BOTH SIDES OF A HEADING

At each of the points *F* and *G* in Fig. 1 or near them are two equal and opposite thrusts of such a magnitude that when combined with the successive weights of the various vertical slices of rock they will form a curve of forces, an inverted funicular parallelogram passing through the arch abutments, that is, the coal pillars.

LINES OF FORCE NOT LINES OF FRACTURE

Such curves of forces I have endeavored to indicate by dotted lines on the cross-section, but it is essential that we do not misconceive their purpose. They do not represent the edges of fracture. It is true, fracture may ultimately extend somewhat in the manner indicated, but, on the other hand, it may not.

The arch is just as truly an arch if the slabs of which it is composed never show the well known arch effect. But if they do, the structure is thereby strengthened, a great load is removed from the center of the span and the thrust at *F* and *G* necessary for the permanence of the structure is reduced. And thus again further breakage tends to permanence instead of to demolition.

HORIZONTAL SHEAR

It is clear that each of the two big roof slabs comprising each arch is, at the commencement of the arching action, a huge rectangular parallelopiped, or rather

NOTE—Paper read at the winter meeting of the Coal Mining Institute of America, Dec. 9, at Pittsburgh, Penn.

tends that way for probably none of the rents *CC*, *FF*, *EE*, *GG* and *DD* pass from the surface to the coal or from the inside of the mine to the surface, as the case may be, and perhaps the rents as far as they go are not by any means as straight as portrayed.

But supposing the blocks as giant rectangular parallel-opipeds, if they are to revolve so that *F' G'* touch the mine floor they must be distorted into trapezoidal parallel-opipeds as indicated in the figure, and this could be done either by a continuous deformation from the surface to the inside of the mine or by the sliding of one stratum past the one below it at points where the conditions were most feasible for that action. Where beds of slate, sandstone, shale, coal and clay appeared, the degree of malformation would be greatest and would develop soonest, roughly in the order in which those beds have just been named.

It is clear that at the mid-span *F* of the opening the deformation arises at the surface first and from the thrust

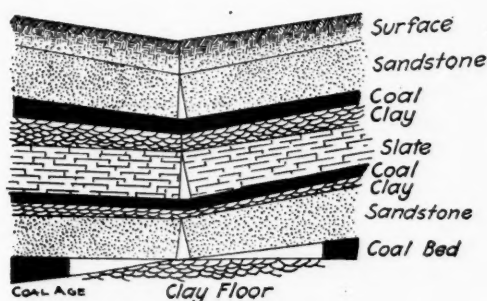


FIG. 2. HORIZONTAL SHEAR DESTROYS ROOF MASS AT ITS WEAK COAL AND CLAY STRATA

of the arching blocks on one another, but the deformation in the mine is from the thrust of the blocks forming the arch on the blocks against which they abut. These thrusts in the lower strata of the arch arise from those in the upper, for it can easily be seen that the block can revolve on its fulcrum at *H* without crowding at *I*, providing it is free at *F*. The thrusts at *F* keep crowding the lower strata of the roof mass toward the adjacent rock masses at *I* and *J*.

Thus all the roof is subject to horizontal shear, and if the abutting roof masses remain firm the roof will not give way till that shear has taken place and the final demolition may be delayed, as has been seen, by breakage of parts of the arch and consequently reduction in the burden to be carried.

PARTIAL BREAKAGE UNDESIRABLE

The partial breakage reduces thrust, but it often preserves enough of it to do the dreaded harm, and whereas a complete fall would make further pillar extraction easy, a partial fall leaves further work subject to all the dangers consequent on the existence of large vaulted areas with great crushing strength and large overturning thrusts.

Where the measures are near the outcrop, the arch is weakened by the reduced strength of the measures in horizontal shear with the consequent ease of deformation of the parallel-opipeds and by the weakness and inconsiderableness of the adjacent roof masses which move freely under severe thrusts. When working against old broken areas, the abutting roof masses are not sufficiently

resistant, and without much or even any horizontal shear the arched masses may settle down easily onto a support.

FIRST OPENING IN VIRGIN COAL

But when the coal extraction starts in the heart of the hill and the roof masses around are unmacerated by the weather, unbroken by mining, vast in extent, and cannot well be thrust into flexures because other parts are not mined, then indeed it is hard to break the roof so completely as to overcome its final resistance. It is true that some compression on surrounding roof masses will permit some accommodation to the stress demands of the arched opening, but it is insufficient, and the result is that an opening in virgin coal is apt to cause a squeeze. The roof will over-ride the pillars before it will give way.

It is important to keep in mind the arch action of the roof, to visualize it by imagining spans of actual highway or railway bridges so as to get a concept of the conditions which may result in failure. It is well known that the thrust of two arch spans equally loaded per foot run will depend on the lengths of the respective spans. If the two openings are parts of one bridge and the arches spring one on each side from a common abutment, that abutment will tend to be thrust over toward the smaller span because the thrust from that span is the less important of the two.

OVERTURNING ACTION

Against such an action the abutment must be designed. When the spans are equal, however, a less massive abutment will serve. It then needs only to be strong enough to uphold the downward pressures and to withstand internally all the stresses which come on it, but it does not need weight or breadth of base to cope with an overturning and unbalanced thrust. Just as an abutment between two equal spans is favorably situated, so is a mine pillar between two batteries of rooms of equal length. In some cases where the wicket system gives rooms aggregating 500 or 600 ft. on one side of the heading, and the single-entry system gives rooms about half that length on the other, the balance is far from perfect and the risk of pillar overthrow not by any means inconceivable.

Fortunately, the direction of thrust cannot be often less than 30 deg. to the horizontal, and as the coal is rarely as thick as piers are high, it is not so likely to fall over and beyond the "middle third" of the foundation even when the pillar is small.

THRUST OFTEN NOTED, BUT ITS SOURCE IS OVERLOOKED

There are many mining phenomena which we overlook. I have mentioned already the partial collapse of the roof at points beyond observation, and as has been generally thought beyond stress, and also the recovery of strength of a roof which offhand might be believed to be beyond further resistance. But there is another more patent action; that is, thrust. We have all seen it and noted it, yet most of us are still convinced that the roof collapses from shear.

Testimony from all sources is that the roof just breaks and comes down; that is, shears. "Yes," some men have stated, "it breaks almost straight along the pillar edge and falls till it chokes. You can see for yourself that rock when piled in an irregular mass fills up an excessive amount of room. So the roof rock when it ultimately falls completely chokes the open space. Then only is the weight relieved."

I am persuaded that there is some truth in this story where the distance to the surface is not great. In most of such cases, shear is evidently the leading cause of demolition, and the ease of examination makes the evidence so overpowering that it is accepted as universal rather than as particular.

THRUST IS NOT RARE AND IT PRESUPPOSES PRELIMINARY FRACTURES

But the frequency of thrust should convince us that the arch action is just as common as that of the beam. If the roof did not act as an arch, there could be no thrust, and I think it true also that arch action could not exist in an unbroken roof beam. It would be a beam then, not an arch.

A continuous girder crosses abutment after abutment. The spans are now short, now long, but there is no thrust, for the truss is self-sufficing and sustains in itself its tensions and compressions just as does the roof beam till it breaks. Then it has to rely for its stability on its abutments, the pillars and the abutting roof measures, and depends on these till failure is complete.

For present purposes, we will assume that the pillars do not crush, the bottom heave, the adjacent roof mass give way either by compression, folding or sliding or the falling block bend toward the opening and so by flexure reach the mine floor. What, then, must be the distortion of the block of rock which falls forward to crowd into the excavated space?

Let us suppose the block to be $A B C D$. If it fell forward unrestrained it would reach the position $A' B' C' D'$, but instead it is distorted into the shape $A'' B'' C' D'$. The vertical fall DD' involves the distortion $A' A''$ and $B' B''$, and this will be greater or less than DD' , as $B C$, the cover, is greater or less than $D' E$, the collapsed half span. It is also proportional to DD' , which is the coal thickness.

MODIFYING ACTIONS

Of course the tendency is for the ends AD and BC to sag and consequently the fall is less than DD' ; moreover, the bottom will heave and the pillar will crumble, decrepitate on the edge and compress. All these actions reduce the value of $A' A''$. But in any event, the distortion is significant and one begins to see roof demolition in its true light. When we see how immense is the change in shape, we begin to wonder that the roof ever falls. Its strength in bending moment and still more in shear and as an arch is marvelous, though the latter resistance is soon rendered futile when the pillars or abutments on which it rests are removed.

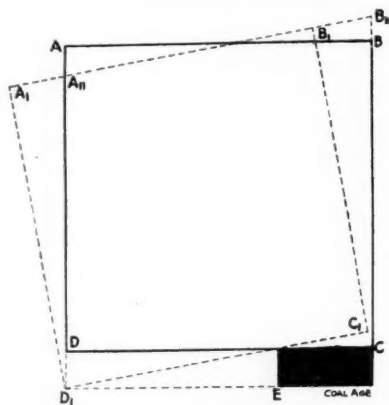


FIG. 3. SHOWS HOW THE DISTORTION OF THE ROOF MAY EASILY BE GREATER THAN ITS SUBSIDENCE

THRUST A LOCAL ACTION

But there is another consideration. You have often noticed in pictures of European churches and perhaps also in the illustrations of the new cathedral of St. John the Divine, New York City, buttresses which take up roof thrusts and curve them harmlessly to the ground. There is little prospect of such stress-line curvature in the coal pillar itself, because the load is mostly on the pillar edge and the downward pressure declines as the heart of the pillar is reached. Still the stress line in the coal rib like that in the cathedral buttress is somewhat curved in its short length and, in any event, is located definitely by Nature. That is, we may not know where it lies, but lie it does at some place and not at any other.

The curvature in a bending beam, the tilting in a broken roof mass and the arching which follows, all put pressure on the edge of the pillar and not on its center. That is why it is so important to emphasize the flanking strength of pillars rather than to consider what their power of resistance would be if they were stressed over their whole area.

By the strength of the edge, a pillar stands or falls. If the edge is unequal to the load and thrust, it is annihilated and a new edge appears. If this is unequal to the work of resistance, it fails and the burden moves back till it comes to an edge which is resistant or until the whole mass is overborne. The pillar is destroyed not

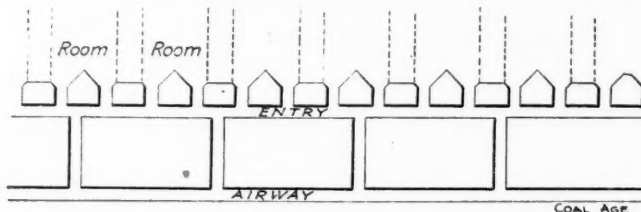


FIG. 4. A FLANKING PILLAR WHICH SOON GIVES WAY, DESTROYING MINE ENTRY

so much as a whole as in parts, even as an adequate army may be overcome by progressively attacking with superior forces detached battalions along the front.

Nevertheless, we always make the mistake of making the edge of the pillar weaker than the heart. It is, for instance, on the edge we break it up with room necks. Sometimes we weaken it further by widening our rooms with a 45-deg. slope on one or both sides, but everything beyond the room neck proper is gone beyond repair.

No argument based on structure can defend the funnel-necked or half-hopper-mouthed room. The only excuse for such a chamber is to be found in convenience in widening. The argument for funnel-necked rooms is that coal anywhere is a source of strength. It is about as true as the statement that a regiment anywhere, even with the enemy surrounding it, is a help in the battle line.

TWO NECKS TO A ROOM OR THREE ROOMS TO A NECK

Also it is necessary to call your attention to the fact that the flank of a heading from which rooms are turned is nearly always weaker than the chain pillar which is only pierced by crosscuts. Especially is this true where double rooms are driven with two mouths to each chamber. It would be far better if we could get to the better "Main Line" or "Altoona" System and put three rooms to a neck.

Some of the expense in making room necks long and the stumps thus adequately deep could be met by reducing the size of the chain pillar and economizing in crosscut payments.

CHAIN PILLAR A VENTILATING DEVICE ONLY

For the chain pillar is first, last and all the time a ventilating device and not a roof support. It does not sustain the roof. That work is done by the heading stumps if it is done at all. In fact, as has been seen, it may be seriously doubted whether the heart of a chain pillar is as heavily burdened after mining around it as it

hear affirmatively from those whose whole attitude has hitherto been negation.

Till such a time one may be permitted to believe in a progressive advance in demolition. First, a condition as yet, I believe, unnamed, a condition symbolized by the tunnel in solid rock in which roof and sides and floor all partake of the beam strain. Second, a horizontal shear which converts the sides into mere supports and the roof into a true beam or plate. Third, a rupture of the roof which converts it into an arch, and finally, a failure of the arch or vault by one of the many weaknesses to which such structures are subject.

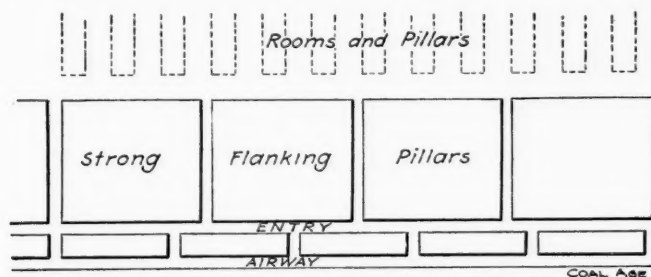


FIG. 5. THE "MAIN LINE" OR "ALTOONA" SYSTEM, WITH STRENGTH CONCENTRATED ON THE FLANKING PILLAR

was before a pick entered the territory. The old military rule of protect your frontiers is as true of mining as it is of strategy.

Perhaps I may add another military maxim: "Always respect your adversary." There has been a disposition to adopt the panel system to excess. The first man who said "panel" to me urged a panel every ten rooms. He wanted a room-and-pillar space left at every tenth room. This might work in the weak-topped Freepoint measure. It might work anywhere—where it is not needed.

But when paneling is expedient, excessive paneling is worse than none at all. The roof must be given a chance to break, and if it will not break, to bend and come down. The wicket system of operation is the most desirable except where a long continuous breaking face extending from room heading to room heading is provided.

Some people favor drawing just a few rooms at a time, and then a few more. If the top breaks easily, this does no harm, for no harm can possibly be done when the roof is fragile. But where it breaks with difficulty, there can hardly be a worse method. A break is what is needed, and the area to provide one should be opened up as speedily and as completely as possible, and around that prepared break, strong pillars should be provided.

MERE SHEAR THEORIES OVERLOOK THE FACTS

Finally let me remark that no matter what may be said about the roof, the statement is bound to be attacked. There are always a number of people who believe that a theory regarding anything is a waste of time and a folly. So we are told the roof is not a beam or a plate, not an arch or a vault. It is so much easier to say the roof just "comes down and chokes the opening as anybody would know if he went into the mines." Such "practical" people, as voice such sentiments, refuse to consider the question and completely overlook, as usual, the fact that they have an unacknowledged theory which put into scientific words is "all failure is from shear." Let us

Composite Pit Propping in Great Britain

The following article from the *Glasgow Herald* of Oct. 26, 1914, says the *Daily Consular and Trade Reports*, shows the working of a new British system of pit propping:

"On the invitation of the Lothian Coal Co., the members of the National Association of Colliery Managers, to the number of 150, visited Newbattle Collieries, Newtongrange, to inspect the system of composite pit propping which has been successfully inaugurated in the pits there. Consequent on Germany declaring pit wood to be contraband of war, there is a perceptible scarcity in the material commonly used for propping underground. On that account the system practised in Newbattle Collieries, by which the use of pit wood has been almost entirely eliminated, has aroused considerable attention in mining circles.

"The visitors were received by the mine managers for the Lothian Coal Co. They were taken through the workings underground and shown the propping arrangements at the working faces, the machine runs, and in the vicinity of the conveyors. The composite type of support used is a steel tube containing a wooden prop and renewable end pieces. The renewable end pieces, 6 to 9 in. long, are made of seasoned larch. It is claimed that the props are easily set, that they occupy a minimum space at the face, that they can be easily withdrawn, and that when even buried under a fall of roof can be recovered if they are seen. The workmen have a feeling of security when working with these supports, as the roof is allowed to creep down steadily on the props, while the latter, instead of weakening under the load, are strengthened. Old tubes may be utilized, such as those from water-tube boilers or disused compressed-air piping. An advantage is that these composite props can be conveniently made at collieries.

"The coal company's agent indicated that the system, which was begun about three years ago, was now proving successful in every way. It took time and supervision to make it successful, but he claimed for these composite props that they possessed infinite possibilities for underground work."

The council of the Derbyshire miners has expressed itself in favor of electric lamps. Recently this council discussed a proposal to introduce electric lamps at the Glapwell colliery. It was pointed out that the spread of nystagmus among the miners was a serious matter, and that the leading medical authorities had expressed the opinion that the general introduction of the electric lamp in collieries would mean a diminution of nystagmus cases, and might lead to the stamping out of the disease altogether.

Meeting of Coal Mining Institute of America

By R. DAWSON HALL

SYNOPSIS—The session at Pittsburgh was well attended and fully up to the high standard maintained by the organization. The papers were of exceptional merit. No summer meeting will be held next year.

✠

The Coal Mining Institute of America met at Pittsburgh, Dec. 8, with the officers afflicted with a severe attack of the blues. The summer meeting at Monongahela, Penn., had been a comparative failure; the finances were in as unfortunate a condition as at any time in the history of the organization and "ways and means" seemed the most important matter to discuss.

But Pittsburgh always seems to galvanize the institute into life. The winter meetings held there are always successful, many members coming from long distances to take part in the discussions. Even a summer meeting called almost without notice was fairly attended eighteen months ago. But as has been said, the officers arrived discouraged and proposed dispensing with the summer meeting, and the members showed no resentment so the recommendation was adopted.

But the idea did not arise out of the attendance at the winter session. No more successful meeting was ever held. Someone had overlooked sending invitations to the Carnegie Technical School and the University of Pennsylvania, relying on the newspapers to do the work. The papers though furnished with printed press notices of the meeting were too busy recording the war to have space for technical societies. As a result the attendance of the institute consisted solely of members and yet was larger than a year ago when numbers of students filled the chairs.

THE ANNUAL ELECTION

The morning was devoted to the election. Unfortunately the full attendance had not then arrived. The returns were as follows:

For president: J. K. Johnston, East Haven, Conn., 23; W. Seddon, 18.

For first vice-president: W. Seddon, Brownsville, Penn., 24; W. R. Crane, 8, and J. Williams, 8.

For second vice-president: J. Williams, state mine inspector, Altoona, Penn., 26; W. R. Crane, 11, and R. D. Hall, 5.

For third vice-president: W. R. Crane, dean of mining, State College, State College, Penn., 20; R. F. Monteith, 11; C. L. Clark, 9, and H. Kinlock, 8.

For three executive board members: George E. Gay, consulting engineer, Uniontown, Penn., 39; W. E. Fohl, consulting engineer, Farmers Bank Bldg., Pittsburgh, Penn., 35; J. Knapper, state mine inspector, Philipsburg, Penn., 34; C. L. Clark, 29.

For secretary-treasurer: C. L. Fay, president, Lehigh Oil Co., 18; C. L. Clark, 13; R. D. Hall, 7; S. B. Smith, 5.

It will be seen that J. K. Johnston and C. L. Fay have been reelected, which is evidence of the confidence the members have in their management of affairs.

LONGWALL IN PITTSBURGH MEASURE

The afternoon session opened with the president's address and as is usual in such institutes, it dealt with the discouraging question of finances. Then the question box was opened with W. E. Fohl in the chair. W. Sed-

don opened the discussion on the query: "Is the Longwall System Applicable to the Pittsburgh Seam of Coal?" S. A. Taylor followed, pointing out its lack of applicability to the bed in Ohio which is known as the No. 8 seam. The roof breaks up too high, sometimes as much as 20 ft. and the bottom is too soft.

Leo Gluck, formerly assistant to the president of the Pittsburgh Coal Co., and for some time engineer of the Spring Valley Coal Co. in Illinois, spoke on the Illinois longwall methods and the conditions under which difficulties were encountered. Mr. Gluck declared that the irregular work in the Pittsburgh region would make longwall operation difficult as steady work day by day is desirable. Mr. Lewis emphasized the difficulties of driving longwall forward with a straight face and said that in Nova Scotia he had found that the scalloped working line gave far better control. T. A. Mather and W. H. Howarth also discussed the question.

LONGWALL IS COMMERCIALY FEASIBLE IF SOMEONE WILL VOLUNTEER TO BUILD THE PACKS

The criticism of the discussion made by one of the speakers was quite apposite. Nearly everybody avoided saying anything definite about the adaptation of longwall to the Pittsburgh measures. Those who did declared against any longwall advancing methods. The only possible form of longwall favored was retreating and the evident consensus of opinion was that a longwall which was a mere development of room and pillar was the only possible solution. By reducing the widths of the rooms and by increasing the size of the pillars, a long cutting face is obtained without any need for packwalling.

The miner today wants a definite pay for cutting coal and extra for building a pack. Though longwall coal can be dug more easily and rapidly than room-and-pillar coal, he wants to get the same price per ton. As for the packwalling, he will graciously consent to let the operator do it for him, if in so doing he will keep out of his way and not hinder the movement of cars to the face. That is largely why longwall fails and will fail. Neither miner nor operator seeks to sustain the severe burden of conservation of fuel resources.

THE VEXED QUESTION OF VOLTAGE

John I. Pratt opened up the question, "What Is a Safe Voltage for Use in Coal Mines?" He urged the abolition of overhead wires underground. No one doubts but what the trolleyless locomotive and the leadless coal cutter are desiderata but it will perhaps be some time before the first is generally used for main-line service, despite its unquestionable excellencies for gathering coal cars.

The difficulty of excessive weight and size *might*, however, be excused in such a locomotive but clearly a mining machine propelled by cells is at present too cumbersome for consideration. It is true the batteries could be kept on the rails but in that case, the mining machine would have leads and the present dangers would only in a small degree be eliminated.

W. A. Thomas, who was scheduled to reply, was not present. J. S. Jenks spoke in favor of high-voltage, saying that while much inadequate low-voltage equipment was on the market, the high potential equipment was generally reliable. Anybody could make the former, and competition caused frequent departures from safe practice.

He advocated the use of oil switches and, on an inquiry being made, denied that any risk of fire was to be apprehended from such apparatus if properly constructed. The temperature rise should be negligible and the flash-point of the oil such as to eliminate risk. He did not think that the one English instance mentioned by the questioner was an important evidence of the dangers of oil switches or would indicate that they should be excluded from any coal mines. It had been argued that where there was no danger of gas it was a mistake to introduce the oil switch and expose the mine to the risk of an oil explosion or a fire.

Mr. Jenks is not an enthusiast in the matter of high voltage, for while advocating 2200 volts alternating current for distribution purposes, he recommended that the voltage be reduced to 220 volts before the current was used or passed along open wires.

DO COMPENSATION LAWS DECREASE ACCIDENTS?

E. N. Zern replying to the question, "Do Compensation Laws Increase or Decrease Accidents in Coal Mines?" spoke quite favorably of the effect of such legislation. This should be stated because the local press, emphasizing what was said about malingering, misconstrued Mr. Zern's remarks. Mr. Zern addressed a letter of inquiry to several operating concerns and his article was a brief of the replies. One operator reported an increase in accidents and eight others a decrease since the compensation laws went into effect. Twenty-five operators denied that there was any increased carelessness on the part of the miners. Ten found evidences of malingering, fourteen found none.

It appeared that the reform legislation quickened the conscience of the operator without any apparent dulling of the miner's sense of duty. The employer took an increased care to guard the workman as a result of his knowledge that he must compensate the latter for all injuries. John Simpson refused to discuss the matter as the law had been in force at his mines only a few months and during quite a large proportion of that time the mines were idle. S. A. Taylor declared he had suffered from a perfectly obvious piece of malingering and he introduced the statistics from the State of Washington, to show that accidents had increased immensely since the compensation law went into effect.

PORTABLE ELECTRIC LIGHTS

Gus. H. Deike read an interesting paper in answer to the question, "What Are the Advantages and Disadvantages in the Use of Portable Electric Lamps?" J. L. Ryan, who was also scheduled to speak, was unable to be present, owing to ill health. E. M. Chance said that the Philadelphia & Reading Coal & Iron Co. had had marked success with electric hand lamps so long as they were used by officials but had found the results less favorable as soon as the lamps were given out promiscuously to all the men in the colliery. The cry about the failure to detect bad air had also been raised relative to acetylene lamps, but he hardly thought it worthy of the consideration given to it.

F. A. McDonald, chief engineer, National Mining Co., stated that there was difficulty in inducing the miners to accept flame safety lamps but that the men had taken quite kindly to the electric cap lamp, and he had found that it gave satisfaction, doing away with the necessity for mixed lights. It thus "filled a long felt want in the Pittsburgh district." He said the National Mining Co. had tried lamps of 10 different makes for several months and is now buying more. The compensatory provision in the mining scale is insufficient in itself to recoup the operator for his loss in introducing the lamps but the increased safety makes up for the defect in the differential.

Mr. Dunbar stated that there was really no objection to the safety lamp. Where it was used exclusively there was never any lack of men. It was in the mixed-light mine that there was difficulty in introducing safety lamps.

REGULATION OF COAL PRICES

The banquet in the evening was addressed by H. Martin Chance, of Philadelphia, Penn. Mr. Chance said that the coal business needed no further regulation. It had already been subjected to enough. The wage of the employee, it is true, had not yet been made a part of legislation, nor had the actual price of coal, but only these items remained for further legislative interference. Perhaps no one present adequately realized, till the speaker pointed it out, how extensive and apparently burdensome the regulation was. T. L. Lewis, former president of the United Mine Workers of America, pleaded for a law setting a minimum price for coal and for a new era of safety and conservation in place of present ruinous competition.

POLLUTION OF RIVERS BY MINE WASTE

C. M. Young, of the University of Kansas, followed with an address on the pollution of streams by sulphuric acid. He has been conducting an investigation for the federal government to ascertain the causes, effects and means of correction of that condition. He said that the federal authorities were indisposed to put a burden on the coal industry by requiring it to remove the acid from the mine water but he could not say what might be done. Certainly the condition was liable to get worse rather than better as the streams were fast becoming acid, the natural alkalinity being removed by chemical reactions with the sulphuric acid of the pickling plants and the "sulphur water" of the mines.

Mr. Young said that the mine waters could be utilized to make paint, fertilizer and chemicals for gas purification. Whether ferric hydrate is merely a stimulant or a real plant food is not clear but certainly vegetation shows excessive greenness wherever this chemical is deposited by water. The sulphuric acid in the streams is causing some damage to locks and a solution is desirable if the cure is not more expensive than the injury it repairs. Prof. H. H. Stoek, dean of mining of the University of Illinois, though announced, was unable to be present.

AN EMBARGO ON BRITISH COAL

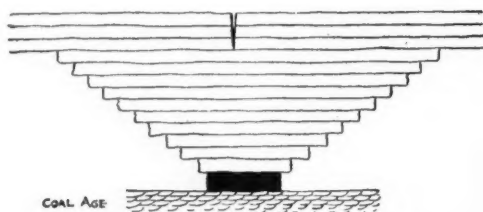
On the second day, Dr. E. W. Parker read an article on the "Foreign Trade of the United States." Dr. Parker suggested that Great Britain would probably shut off the export of her coals for fear of their ultimate exhaustion. Someone took strong exception to this and indeed anyone acquainted with the individualistic spirit of the British would find it hard to believe that they could

adopt such a policy before other nations. They may copy social measures of that kind but even the most serious necessity will not induce them to initiate them. As was stated, the 25c. export tax on coal was hardly imposed before it was removed.

E. C. Roberts spoke favorably of briquetting fuels for foreign use. E. M. Chance declared, however, that the finer sizes of anthracite, known as slush, were often too impure for the making of good briquettes. E. W. Parker urged that ground barley and rice coal would make a good grade of boulets at a lower price than could be placed on anthracite coal of equal size. It seemed generally believed that the boulet trade suffered from the antagonism of the anthracite retailers who found it competed with the unsophisticated egg coal.

THE PROGRESS OF THE ROOF FROM BEAM TO ARCH MAY BE REVERSED

R. D. Hall read a paper on the "Last Stand of the Mine Roof." Lack of time prevented a sufficient criticism of this paper, but S. A. Taylor's comment, hardly understood by the reader of the paper, was nevertheless much to the point. He thought that when the mine roof was resisting as an arch, a large fall of the material composing the span might so reduce the loading that the bending-moment stresses might be able to take up the burden.



A CANTILEVER MINE ROOF

The split in the roof may not be sufficient to destroy the beam resistance. The breaking of the beam over the open spans enables the tensile stresses to cope with the roof loads.

In fact it does seem that the change of the roof from a beam to an arch may be a gradual transition and may as Mr. Taylor suggests be retrogressive on occasion as well as progressive. The illustration shows a condition where the fracture at the surface may be insufficient to prevent the roof from acting as a cantilever after large falls have taken place in the spans on either side of the pillar.

C. L. Clark thought the author's criticism of his own paper was justified in that sufficient stress had not been laid on the dome as opposed to the arch structure. On motion of W. E. Fohl, it was provided that the editor and author should republish the two papers previously presented by him on that subject in the proceedings for 1914 so as to make the series complete.

DR. CRANE DESCRIBES HIS INTERESTING EXPERIENCES

Dr. W. R. Crane spoke at the afternoon meeting on "Personal Observations in Alaska." This was perhaps the leading feature in the program though a thoroughly untechnical number. Sumner S. Smith, U. S. mine inspector for Alaska, addressed the meeting on mining frozen ground.

L. M. Jones, assistant mining engineer of the U. S. Bureau of Mines, read a paper on "Coal Dust Experiments

at the Experimental Mine, Bruceton, Penn." It seems that the failure of the Taffanel barrier in case of light explosions is probably due to the inability of such explosions to perform the task of upsetting the boards loaded with shale dust. At first it was suggested that the Taffanel barriers failed because they were completely discharged of dust before the last of the flame reached that point in the gallery. To correct this a barrier which could be partly discharged by a light wave and then completely destroyed by a heavier one was designed. The principal value of the Rice barrier appears now to lie rather in its sensitiveness than in its double-barreled action.

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Kentucky Mining Institute

The regular mid-winter meeting of the Kentucky Mining Institute was held in Louisville, Ky., Dec. 4 and 5. There was a good attendance at this meeting, in the neighborhood of sixty coal men being present. The papers presented were interesting, and the discussions that followed their reading were of much educational value. The program was carried out practically as published in *COAL AGE*, Nov. 7, p. 752. It will only be possible here to refer briefly to the several papers read, many of which were discussed by the members present.

The meeting was called to order Friday afternoon, at 2 o'clock, by the president, H. LaViers, of Paintsville, Ky. In the absence of the mayor of Louisville, the address of welcome was made by Charles F. Taylor, of the Board of Public Safety. A telegram was received from George H. Cushing, Chicago, Ill., expressing regret at his inability to be present; and his paper, dealing with the opportunities for an increased export trade for coal, was read at a later session. F. V. Ruckman, general manager, Highland Mining Co., Providence, Ky., read an interesting paper on "Coal Mining in Western Kentucky." This was followed by another paper presented by J. W. Paul, of the Federal Bureau of Mines, entitled "Some Benefits of First-Aid Work in Mining." An informal address, by J. T. Beard, on the need of more intelligent and efficient mining laws and legislation, closed the session.

At the banquet in the evening, White L. Moss, vice-president of the Continental Coal Corporation, Pineville, Ky., acted as toastmaster, and the occasion was enjoyed by all present. The speakers were H. LaViers, president of the Institute; Frank H. Cassell, president Merchants and Manufacturers' Association, of Louisville; W. H. Cunningham, of Ashland, and E. B. Wilson, of Scranton, Penn.

Following the reading of Mr. Cushing's paper on the coal-export trade, at the Saturday morning session, the Institute listened to a very interesting and profitable paper by K. U. Meguire, president, Harlan Coal Mining Co., Coxton, Ky., which discussed the features and possibilities of the Workmen's Compensation Law in Kentucky. The constitutionality of the law was then being considered by the Court of Appeals, which was expected to make its report the following Tuesday or Wednesday. After the reading of Mr. Meguire's paper, Assistant District Attorney Caldwell, of Frankfort, at the request of the members, outlined the general procedure that would be followed by his office, in case the constitutionality of the law was affirmed. Mr. Caldwell stated that proper blank

forms and instructions would then be issued and distributed to the coal companies for their information and direction.

Prof. C. J. Norwood, dean of the College of Mines and Metallurgy, of the State University of Kentucky, then read an interesting paper describing the need of the better education of miners, and the efforts being put forth by the university, to that end. This paper was followed by a very practical paper on the "Humidifying of Mine Air, as Practiced in Eastern Kentucky," which was prepared and read by J. W. Reed, assistant inspector of mines in Kentucky.

Owing to the heavy rain falling, few of the members made the projected trip to the Speed Cement Works, in Indiana. Those who availed themselves of the invitation were amply repaid by the demonstration given at the works, where a blast of 960 lb. of dynamite was exploded in the quarry, dislodging 960 cu.yd. of rock.

In the evening, the members of the Institute were entertained at a local theater, where they witnessed Billie Burke, in "Jerry." During the sessions, the privileges of the Engineers' and Architects' Club were extended to the members of the Institute by Malcom Elliott, president of the club.

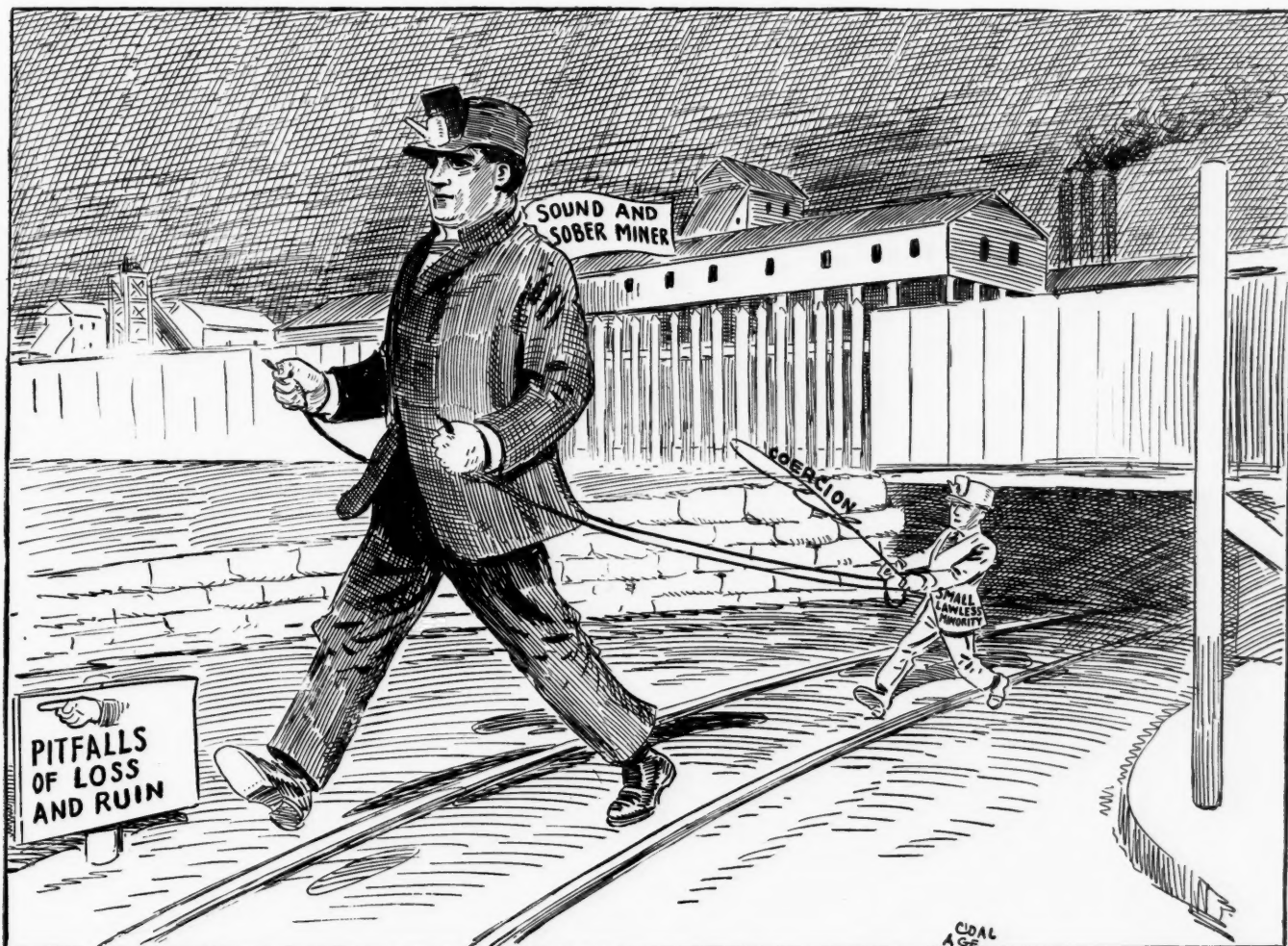
It is to be regretted that it will be impossible to publish in full, in COAL AGE, the several papers presented at the meeting; but these will be abstracted in future issues.

A Unique Advertising Scheme

A Denver coal and coke company recently used a novel advertising scheme. An ordinary 10-in. electric fan was installed in the window, over which was placed a heavy wire guard, shaped like an inverted wastepaper basket. Inside and fastened to the upper part of this guard, six red lights were hung. Next, two dozen red ribbons, a half-inch wide and eighteen inches long were attached to the upper part of the guard; then chunks of coal about the size of a coconut were piled around the whole in pyramid form having a 12-in. opening at the top. Through this opening the ribbons projected, and were kept extended and fluttering by the draft from the fan.

At night a distance of forty feet away, the combination presented a vivid spectacle as of a mass of coal on fire with flames belching from the top. Placards, quoting prices and telling of the superior qualities of the coal handled by the firm were distributed about the window.

Many considerations should be taken into account when selecting the type of rail bond for any given track service; otherwise, the bond may fail to give satisfactory results through no fault in its design or construction. The first thing to be decided upon in making such a selection is whether the bond shall be concealed or exposed. In laying new tracks, bonds can be placed under splice bars at little or no additional cost, provided, of course, there is sufficient space for them. In this position they are protected from breakage, due to external causes, but are not open to visual inspection, nor can their conditions at later periods be determined except by making electrical tests at the joints.



HOW MUCH LONGER WILL HE BE DRIVEN?

The Labor Situation

SYNOPSIS—The Colorado strike is declared by the Union to be at an end. Another conference is planned in eastern Ohio.

The Colorado strike at last has come to an end and none too soon. The public will perhaps say how much better it would have been if the operators had conceded what the miners asked and saved for the country the eighteen million dollars which the struggle cost. The operators will say the same about the miners. Surely neither side can risk such a collision again for many years.

The operators can well afford to meet the possibility of renewed agitation by giving every reasonable and unreasonable assurance of their determination to subject their mine weights to the most careful supervision and to comply with every tittle of the law. Gradually by education they can bring their men to have a clearer conception of the economic situation and by taking the public into their confidence can assure themselves a better hearing than in the past before the bar of public opinion.

The union officials have paid out more than \$3,000,000. The loss of wages is said to amount to more than \$6,000,000; 66 persons have been killed and about 50 injured. It is disgraceful that disorders have been permitted to run to such length without prompt and due state control.

Mistakes in Publicity

The operators have been unfortunate in their publicity. There is no question but that the testimony given before the Federal Relations Committee about the booklet "Facts concerning the Struggle in Colorado for Industrial Freedom" must have done much damage. Yet only one bulletin was found to be at fault while the Union publications and the public-press notices have been full of the most obvious misrepresentations from end to end. It all goes to show that the operators are held far more accountable than their persecutors for what they say and do. As it is, a thousand people have read the criticism to one who has perused the book.

It is unfortunate that the operators did not, on the title page, acknowledge their action in publishing the volume. It is a mistake to veil such attempts to influence public opinion and, in this case, the disguise was so feeble as to be dangerous. All attempts to lead the public should be open and above board and the writer of the paper ought to be willing to acknowledge his work. As a matter of fact, no one was foolish enough to believe the book was a publication put out by nonunion miners in defense of their resistance to the Union. Such paper, editing, language and circulation argue the backing of money and education and no one was deceived.

The Conclusion of the Strike

The mine workers' officials pretend that the strike ends as a victory, though they find it hard to back up the statement with facts. The so called strikers are to try to obtain work. Those who do not will be supported by the Union in the tent colonies as before the strike, according to the statements of the Union officials. Meanwhile, Low, Mills and Gilday will make their inquiry and the miners hope they will yet get the recognition they desire and a commission which will regulate mine employment. The Federal Commission on Industrial Relations expected to complete its work on Dec. 16 and to leave for Washington, beginning further hearings on Dec. 28.

The Conference Which Failed to Confer

The development of interest in the labor situation in Ohio during the past week was the effort on the part of certain officials of the Ohio district of the United Mine Workers organization to call another conference of operators and miners to discuss the situation in eastern Ohio. The date set for the conference was Dec. 11 and the place, Canton, Ohio. But the operators were skeptical and refused to attend. Moreover, only a few of the miners appeared and so no meeting was held. The harmony committee of Wheeling, W. Va., was back of the conference. This is composed of the merchants doing business in the districts where the strike still continues.

No Open Shop in Ohio

At a meeting of eastern Ohio operators in Cleveland last week the question of opening mines on the "open shop" plan was discussed pro and con. It was learned that quite a majority of the operators were opposed to employing strike-breakers and as a result a declaration against the plan was made.

The sentiment of the meeting was that the operators would wait until after the convening of the next legislature

in the hope of having the mine-run law repealed. Quite a few of the operators wanted to re-open their mines but they gave in to the larger number. It is doubtful if there is any strong sentiment in the legislature for the repeal of the measure but a strong fight will be made to that end.

A temporary agreement was made with the miners by the Oden Valley Coal Co., just west of Conesville in the Coshocton district. This fixes a price of 67.6c. per ton for pick-mined coal and the operators are to return the empty cars to the point of loading or are to pay at the rate of 4.5c. for pushing.

The West Wheeling Mine, it is said will reopen on Monday on a profit-sharing basis. It is said the Ohio Mining Department has been at Bellaire inspecting the mine. It is thought that other mines may test the value of such arrangements. The effect of profit-sharing as opposed to operation under a scale will be to utterly disrupt the Union and it will probably bankrupt the coal companies also.

The "United Mine Workers' Journal"

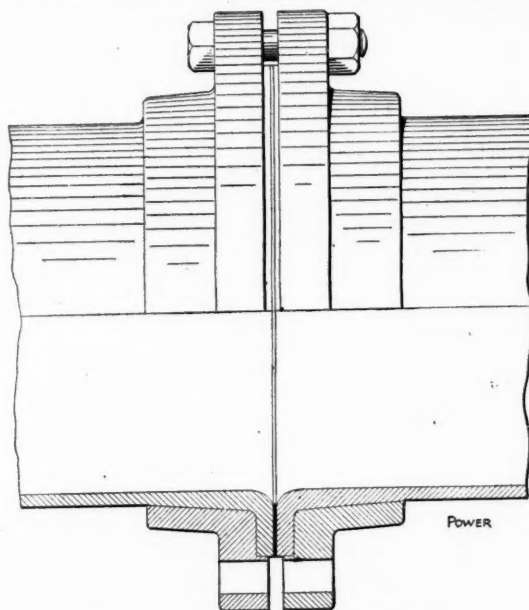
The "United Mine Workers' Journal" has appeared as a magazine. Instead of 8 pages, there are 32 including the advertisements and the cover. Its appearance is certainly more attractive than it was. The magazine measures 10½x13½ in. and will appear weekly as before. The operator will do well to notice an important innovation. Parts of the paper are published in three languages, English, Italian and Slovak. It is time that operators did as wisely as the Union in providing their men with information. They should impress their viewpoint on their employees year by year as steadily as the Union emphasizes its aims and ideas on its followers.

In Arkansas the strike still continues. E. Stewart, who is investigating conditions for the Federal Department of Labor, says it will last all winter.

Improved Reinforced Van Stone Joint

A type of Van Stone joint, known for a number of years as the improved reinforced lap joint, says *Power* for Nov. 17, is made by spot welding a collar to the end of the pipe, which is then flanged.

After flanging, the joint is faced on the front, edge and back and turned on a regular taper to the end of the



DETAILS OF NEW LAP JOINT

collar to fit a correspondingly tapered bore flange. The matching is done so that a neat fit is obtained between the pipe joint and the flange.

This joint gives about one and a half times the thickness of full-weight pipe on the face and double the thickness of the pipe through the curve. The joint, see illustration, is manufactured by W. K. Mitchell & Co., Inc., Twenty-ninth and Ellsworth Streets, Philadelphia, Penn.

Who's Who in Coal Mining

Leo Gluck

Another coal man, of long experience in coal-company service, has entered the ranks of the professional consulting engineers. The individual we refer to is no less a person than our good friend Leo Gluck, of Pittsburgh, Penn., who has just recently resigned his position as assistant to the president of the Pittsburgh Coal Co. The following record, therefore, of Mr. Gluck's work and accomplishments is of particular interest at this time.

His early education was obtained at the St. Louis Manual Training School, from which institution he graduated in 1883. From 1886 to 1889, he studied practical mining methods in the mines of Missouri, Illinois, Kansas, Colorado and Michigan. In 1889 he was graduated



LEO GLUCK

from the Washington University, St. Louis, Mo., with the degree of mining engineer.

Following the completion of his university work, he accepted a position as chemist with the Mine La Motte Lead Co., of Mine La Motte, Mo. While serving this company, Mr. Gluck obtained valuable experience in the mining, milling and smelting of lead ores. From 1890 to 1893 he was assistant to the state geologist of Missouri, making a specialty of economic geology of coal. From 1893 to 1896 he worked for the Spring Valley Coal Co. in Illinois, holding the position of mining engineer. It was during this period that he received a State Inspector of Coal Mines certificate for the State of Illinois.

In 1896 Mr. Gluck left the Illinois field and became connected with the engineering department of the Anaconda Copper Mining Co. and the Senator W. A. Clark interests in Butte, Mont. He served these people for three years, when he was appointed superintendent of the Whit-

more Mining Co., Leadville, Colo. This work held his attention for one year.

In 1900 Mr. Gluck returned to Illinois, and for six years thereafter served the Spring Valley Coal Co. as chief engineer; at the same time he acted in the capacity of consulting engineer for the Illinois Third Vein Coal Co. In 1906 he was appointed chief engineer of mines for the Chicago, Milwaukee & St. Paul R.R., this work taking him through properties in Colorado, Montana, Iowa, Utah and Illinois. In 1907 he severed his connection with the railroad people to accept a place as assistant to the president of the Pittsburgh Coal Co. This latter work has occupied his attention for the past seven years.

Mr. Gluck is widely known throughout the coal industry of the entire country. His experience has been so varied in its general character, and of such a broad scope, that he is specially well fitted for the general line of engineering work he has now entered.

Recent Legal Decisions

Rights of Owner of Coal in Place—Where coal in place is conveyed by deed, as distinguished from a mere lease, two separate perpetual interests arise: Ownership of the surface and title to the coal. The owner of the latter does not lose his title thereto howsoever long he may delay in removing it, unless, of course, the time for removal is expressly limited. (Indiana Appellate Court, *McBeth vs. Wetnight*, 106 Northeastern Reporter 407.)

Coal Company's Liability for Subsiding of Surface—A coal company is not liable for injury to the pipes of a water company laid under a township road in Pennsylvania, caused by the surface of the road subsiding in the conduct of mining operations by the coal company, if the water company laid the pipes without condemning the right to do so, since, being a trespasser, the water company cannot complain of an injury inflicted upon it without wantonness. (Spring Brook Water Supply Co. vs. Pennsylvania Coal Co., 54 Pennsylvania Superior Court Reports 380.)

Contributory Negligence of Injured Miner—Employer's Duty Concerning Appliances—Judgment against defendant coal company for injury to plaintiff, a miner, while engaged in moving an undercutting coal machine, is reversed on the ground that if he was injured while knowingly doing his work in a dangerous manner, in violation of instructions, he could not recover. But if the appliances were not in reasonably safe condition, and if the company was chargeable with notice of a dangerous defective condition which directly caused the accident, and if plaintiff was not chargeable with such notice, he can recover, although negligence of a fellow employee may have contributed to the accident. Plaintiff cannot be held to have assumed the risk of any defective condition which existed unless he knew thereof, or it was obvious. (Kentucky Court of Appeals, *Fluhart Collieries Co. vs. Meeks*, 169 Southwestern Reporter 686.)

Validity of Coal-Weighing Ordinance—It is within the legitimate police power of a town or city to adopt an ordinance requiring coal and other bulky commodities sold within the city to be weighed on public scales. "It will be noted that the ordinance does not require products weighed in the city to be weighed on public scales, where they are not to be sold or offered for sale within its limits. A municipality in the exercise of its police power may enact and enforce regulations for the protection of its inhabitants against false and fraudulent weights in the sale and exchange of bulky commodities." But enforcement of such an ordinance may be enjoined if ample provision is not made for weighing. Nor can the ordinance give the public weigher full discretionary power to fix the tare and reductions from the gross weight of coal, "according to the custom of the trade, or as conditions necessary to fairness and justice require," and make the tare or reduction thus ascertained by him a conclusive determination of the same. On the other hand, it is no objection to the validity of such an ordinance that it tends to destroy the business of a particular dealer. "Whatever injury or inconvenience one may suffer in such cases, he is, in the eye of the law, compensated by sharing the common benefit resulting from the exercise of this power for the protection and benefit of the public." (Georgia Supreme Court, *City of Cartersville vs. McGinnis*, 82 Southeastern Reporter 487.)

Editorials

It Is Not Full Pocketbooks as Much as Thankful Hearts that Make a Merry Christmas

A mine manager, perplexed with the problem of making ends meet, sat in his office a few days before Christmas. He could see from his window the big stores all filled with holiday goods. "The Blues" somehow obsessed him as he looked at the visible signs of "Merry Christmas" and thought of the hundreds employed by his company whom he could hardly imagine having a happy Christmas this time.

In his fit of melancholy he was forgetting that happiness and thankfulness are to be had even when money is scarce, but he couldn't see it that day.

He thought of all the work his company had done in looking after the safety and welfare of its employees, improving living conditions by furnishing comfortable and clean homes, pure drinking water, fenced gardens, sanitation, etc., to say nothing of schools, churches, picture shows, and efforts to keep the men from throwing their earnings away for beer, whiskey, etc. He had learned to love all this work. In fact, he was just the man his company wanted to carry out its policies through good times and bad.

But there were still outsiders who, in spite of visible signs of material progress and contented workmen, accused the company of ulterior motives, and today the manager was blue. To get rid of this depression he went out in the street for a walk.

Almost the first man he met was an old employee, a miner who had been in the service for years. Greetings were exchanged and the manager inquired as to how things were going. To his astonishment the miner said:

"Well, very good. I never had so much to be thankful for as now. Of course my four boys are working only half time, but I'm grateful for that. We've a little laid by, and I know the company is doing its best for us."

"But," the manager said, "How can you feel so thankful as you say?"

"Why," the miner replied, "It's when I look across the sea and think of my old home in England and where my four boys might be if I had not come to America, that I am happy. They would all be fighting there, and here they're safe at home with their wives and children."

"Thank God for America," the old miner said. "It's a grand country to live in, and it is companies like yours that make it better every day."

The manager was getting interested now and skilfully he drew still more on the miner's store of thankfulness. He learned how as a boy eight years old he had first entered the mines in Scotland because his presence in the pit meant another ear in the day's turn for his father. The miner told him of how his first work was in 12-in. coal with a band of fireclay overhead; how the men must cut and take down with them their own mine timbers and often leave home at three in the morning to be first in the

mine so as to get the first cars, and so on. Then, briefly he told the manager of what it meant to work in such mines as his company operated, where safety was first and the turn and wages were absolutely fair.

The manager interrupted and asked:

"Well, how about the rest of the men—how are they going to be fixed for Christmas? Will they be thankful too?"

"Why sure," the miner replied. Then he explained that since the yards were fenced, nearly all had winter gardens and many had a cow and chickens. Also that since the plan of operating the commissaries to make money off the men had been changed, so that the stores were run solely as an aid to them; the miners could buy the best goods as cheap or cheaper than elsewhere.

"And you know," the miner said, "you've got rid of the loan sharks and all those kind of people, and as the result of your policies you've trained the men to save some of their earnings. Oh, the men have all got lots to be thankful for this Christmas."

The manager went back to his desk and in his heart there was more of Christmas cheer, thankfulness for what his company had done for its men, and a strong determination to do more.

The foregoing is a true story. Many a mine manager can duplicate it in nineteen fifteen. How many will?

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The Roscoe Letter

We are in receipt of a letter on the letter head of Eclipse Local No. 854, United Mine Workers of America, stating that the Union at that place has passed a set of resolutions asking for aid on behalf of those persons in that community who are in need of help.

They state that the miners in that town have been idle because of the war in Europe which has stagnated industry and owing to the lack of rain which has prevented the shipment of coal down the Ohio River to the Southern ports.

Leroy R. Bruce, who is secretary-treasurer of the Relief Committee and who asks for "anything in the line of food, clothing, blankets or money," says truly "The cotton grower of the South has been affected by the war and has raised the cry for help. We say help him, but do not forget the coal miner when you are doing it."

We have written to Roscoe to ascertain the facts in the situation and find that they are as represented. In reply to our letter, F. W. Allison, secretary of the Roscoe Welfare Association, writes that:

While conditions are very bad here and all along the valley, we in Roscoe and vicinity believe we can, at present, take care of all appeals for help. Our people are responding nobly to the demands made upon them. On Wednesday evening, Nov. 26, 1914, a meeting of citizens was held and an organization was formed comprised of miners, business men, clergy and physicians to look after needy cases. As treasurer, J. W. Stevens, assistant cashier of the First National Bank of this place, was elected to take charge of all finances, and we believe that this organization, the "Roscoe Welfare Association," will conduct its affairs on strict business principles.

We are fully of the opinion that not only in Roscoe, but in many other places money is badly needed to tide the miners over the present severe depression. We hope everyone will do his best to see that the good name of the mining industry is not injured by niggardliness at this time.

The cry of a portion of the public will undoubtedly be: "Take care of America first and let Belgium go by the board." We should undoubtedly take care of our own people, no matter if seven million hungry persons need our help in Belgium. As a matter of fact, we are hardly measuring up to our high standard as Americans. We have hardly a right to pride ourselves as worthy of our heritage till we give more liberally to both our own people and that other nation which has cast its very life as a bleeding oblation to Liberty.

Let us take a look at our generosity to Belgium. To the Belgian Relief Fund, apart from the Rockefeller contributions, we have given perhaps a cent and a quarter per inhabitant of this country, including money, gifts in kind and promises, and to the Red Cross four-tenths of a cent. The men, women and children of the United States have not given more than three cents to the European war per head of population. Let us give at least another three cents to the miners and others who are suffering from the stagnation of business and if that does not suffice perhaps we can even find a dime. Our national honor demands that much liberality.

The people who are so urgent to help America first are many of them helping neither America nor Belgium, except as they assist the former through payment of their taxes. Seeing the Belgian Relief Committee only demands 4c. per ration per day from those who can pay for the food which the committee supplies, apparently the Belgian poor are living on less than a nickel a day. From what we have been able to learn, however, the cost of the food supplied will be about 5c. per diem. We are firmly of the opinion that if the Belgians can live on that, no one need starve here. Rather let those of us who have a competence open our hearts and give. There is no need that any miner or any workingman whether here or in Belgium should suffer from starvation.

Meantime, someone should volunteer to collect and distribute money to those who are in need, not only in Roscoe, but in many other places. In no better way could the solidarity of the salary earners and the miners be better shown. We do not doubt but what the records of many company stores will show a clear sense of duty on the part of operators to whom mining has this year been anything but a source of income. Others, few in number, who have given their men steady work and whose employees are consequently well cared for, could help to swell a fund to aid miners in places where, owing to trade conditions, business has been sorely depressed

A Shakeup in the Anthracite Industry?

As time goes by, it is becoming steadily more evident that the big hard-coalers are acutely feeling the loss of their powerful leader, Mr. Baer. As is well known, the responsibilities of Mr. Baer's office were distributed among a number of men, and there are persistent rumors current pointing to a breakdown of the harmony that has always been so characteristic of the anthracite trade.

For instance, close observers of anthracite conditions are of the opinion that there is a marked tendency to force the market this year, and there has arisen a latent suspicion between the different companies that their rivals are not in every instance adhering rigidly to circular prices. Certainly, the production records some companies are making, as compared with that of others, would tend to substantiate this contention. In fact, there are some who believe that, unless there is a prompt readjustment and a more thorough understanding effected, it is not unlikely that the so called anthracite trust may be subjected to one of the worst price-cutting wars in the history of hard-coal mining.

An American Merchant Marine

In the neighborhood of 110 vessels have come under American registry since Congress, on Aug. 18, amended the Navigation Laws to foster the growth of an American merchant marine. This action on the part of ship owners is significant in that it may mark the commencement of a period of regeneration for our flag on the oceans.

Last year, American vessels in the foreign trade had a total tonnage of only one million as compared with nearly twenty million for the United Kingdom and five million for Germany. However, our foreign trade is insignificant compared with our coastwise shipping. Of 27,190 American ships, 23,520 with a tonnage of nearly seven million are engaged in coastwise trade.

The principal advantage an American merchant marine now gives to foreign shippers is the lower rate of insurance. The rate on American vessels is $\frac{3}{4}$ per cent. as compared with from 3 to 5 per cent. for British ships. This favorable situation augurs well for the expansion of a really worth-while American merchant marine, and we trust that our government will lend such encouragement to this movement that before very long, the stars and stripes will enter foreign ports that have not been visited by our ships since those early days of American pre-eminence on the ocean highways.

No More Coal-Car Statistics

Our readers will learn, with regret, that the American Railways Association has announced that they will discontinue their bi-weekly report on the car surpluses and shortages. The decision was apparently due to the general retrenchment and economy propagandas instituted by all of the important carriers.

COAL AGE early adopted a standard table and chart, giving in detail the exact status of the coal-car supply as shown by this report. This was by far the most detailed analysis of the coal-car situation given by any paper or journal in the country.

There are some statements to the effect that the statistics compiled by the Association have failed to effect the economy expected, but it is to be hoped that in the more prosperous days to come the publication of these statistics will be resumed. Until that time, these statements must necessarily be omitted from our columns.

The industrial supremacy of the Anglo-Saxon and Teutonic races is largely due to their possession of ample coal resources. The coalless countries have fallen back in the world race for commercial pre-eminence. Where coal is found, there we find great industries congregated.

Sociological Department

Club Houses for Mine Workers

Work has been started on two new mess houses of hollow terra-cotta tile at the Franklin and Packerton No. 5 collieries of the Lehigh Valley Coal Co. The design of these mess houses has been practically standardized, and it is understood that similar buildings will be erected at other collieries when the design has been tested by actual use and approved.

The first "mess," or club house, for the outside employees of the Lehigh Valley Coal Co. was opened at the Prospect Colliery in January last year, and was described and illustrated in COAL AGE in our issue of Jan. 25, 1913, p. 153. It proved such a success that a careful study was made of the needs of the men and the facilities which such buildings should afford. As a result a standard design was provisionally adopted.

The new houses measure 40x25 ft. and are 12 ft. in height. There is not a stick of wood in their construction, so they are absolutely fireproof. The hollow terra-cotta tile, which is a standard fireproof material, will be covered with plaster inside and out. The sashes of the doors and windows will be of steel, and the gable roof of corrugated asbestos laid on metal.

The houses will contain a messroom with tables and benches, showers and wash basins with hot and cold water, sanitary conveniences, and a locker room for the men's working clothes. Their sides will be largely of glass and they will be scientifically ventilated, and heated with steam from the boiler houses, so there will be plenty of light, air and heat. A caretaker will keep the houses clean and in order.

This is not the only enterprise of this sort of the Lehigh Valley Coal Co. The space beneath the coal pockets of the Buck Mountain breaker has been utilized for a mess room with shower baths and sanitary conveniences for the use of the men, and there are similar rooms for the benefit of the employees in everyone of the company's fifty boiler houses.

State-Wide Meet at Billings, Mont.

By JOHN SANDERSON*

The first state-wide meet for first-aid workers in the State of Montana was held in the Coliseum Building, Billings, Mont., on Nov. 21, under the supervision of W. D. Ryan, of the U. S. Bureau of Mines, and Messrs. Steidle and Broadman, of U. S. Mine Rescue Car No. 5, stationed at Billings.

The meet was held under the auspices of the Montana Coal Operators' Association, the United Mine Workers of America, District No. 27, and the U. S. Bureau of Mines. On the committee of arrangements, M. F. Purcell represented the operators' association, H. Drennan and R. Condon, the Union, and D. D. Ryan and E. Steidle, the Bureau.

The judges were all doctors and included M. H. Arnold, J. B. Barrett, E. G. Balsam and W. R. Morrison, all of Billings. As only five teams competed the judges were well able to keep the events under observation.

*State mine inspector, Helena, Mont.

The teams and their ratings were as follows:

	One-Man Event	Two-Man Event	Team Event
Northwestern Improvement Co., Red			
Lodge, West Side Mine.....	97.5	96.0	98.5
Northwestern Improvement Co., Red			
Lodge, East Side Mine	97.0	98.0	94.0
Anaconda Copper Mining Co.,			
Washoe	98.0	98.0	94.0
Republic Coal Co., Klein.....	96.0	98.0	95.25
Cottonwood Coal Co., Lehigh	96.0	92.5	94.0

It will be seen that the Washoe team of the Anaconda Copper Mining Co. took first prize for the one-man event, which was \$15 cash. The West Side Mine of the Northwestern Improvement Co. took the second prize in that event, receiving \$10. The East Side Mine of the same company obtained third place and a prize of \$5.

In the two-man event the Northwestern Improvement Co. East Side Mine, the Anaconda Copper Mining Co. Washoe Mine and the Republic Coal Co. Klein Mine were first and equal. Another test gave the award to the last mentioned. The prize was \$15. The second team was that of the West Side Mine of the Northwestern Improvement Co., and the third that of the Lehigh Mine of the Cottonwood Coal Co. The prizes were the same as in the one-man event, \$10 and \$5 respectively.

The team-event prize was won by the West Side Mine team of the Northwestern Improvement Co. This was a silver cup presented by the Montana Coal Operators' Association, to be retained permanently by the team obtaining first place for two consecutive years. Bronze badges were presented by the American Mine Safety Association. The second prize went to Republic Coal Co. Klein Mine and consisted of \$15 cash. The third place was obtained by three teams and on a further competition the Northwestern Improvement Co. was awarded the prize for third place which was \$10 in cash.

The names of the members of the cupholding team are Matt Woodrow, Wm. McIntosh, Ed Heidleston, John R. McFate and L. A. Woodbury.

University of Pittsburgh's Mining Extension Classes

The School of Mines of the University of Pittsburgh has opened its University Extension classes in the mining towns of western Pennsylvania for the third year. Five classes have been organized to study mine gases, ventilation, law and safety, in preparation for the examination for fireboss. These classes are located at Uniontown, Mt. Pleasant, Leisenring, Yukon and Russellton. In addition, a class in more advanced subjects, to prepare candidates for the examination for mine foreman, is being conducted at Irwin.

The enrollment in the six towns is 157, exceeding that of the two previous years. Among the numbers are 5 superintendents, 4 mine foremen, 8 assistant foremen, 14 firebosses, 3 hoisting engineers, 2 electricians and 4 mining engineers. The remainder are chiefly miners, motormen, machine runners, pumpers, timbermen, drivers and clerks, but a few have occupations other than mining. The ages of the students range from 16 to 51. Many are following the courses with a view of taking examinations for certificated positions, while others are taking the opportunity to review subjects already covered, or are pursuing the study as a matter of general interest. With few exceptions, all who have finished the course have passed the state examination for either fireboss or mine foreman.

Each class meets once a week in the evening, from October to April, and is instructed by a member of the faculty of the School of Mines. Notes covering the subjects taken up in the course have been prepared especially for this purpose, together with illustrative problems. The lectures are accompanied with demonstrations of the apparatus studied.

The cost of these courses to the student has been reduced to a minimum. The School of Mines offers the instruction without charge, and expects only that the traveling expenses of the instructor be met by the class. It is hoped that in the near future it will be possible to comply with all the requests received for the organization of mining classes.

Discussion By Readers

Mining Laws, Legislation and Mine Regulations

The discussion that is being brought out on this subject is most interesting and we urge that all our readers submit their views. Eventually we hope to print a résumé of the opinions expressed and then send such summary to lawmakers in all coal states. Legislation that affects an industry affects every individual engaged in that industry; the problem, therefore, is of vital importance to each and all of us.—EDITOR.

✂

Letter No. 10—The suggestion for a frank discussion of mining laws, legislation and mine regulations, *COAL AGE*, p. 698, is particularly opportune at the present time. The recommendations of practical mining men are always deserving of attention; and their suggestions made with a view to improving the conditions in and around the coal mines of this country, if acted upon, must go far toward ameliorating the dangers of mining.

Not only the changing conditions in the mining of coal, but the lessons taught by recurring mine disasters compel both the revision of existing laws and the making of new ones. It was the Avondale (Penn.) disaster that first opened the eyes of mining men, in this country, to the danger of single openings in mines. The lesson taught by that disaster has resulted in the mining laws of every coal-producing state requiring at least two openings to every mine, one of which must serve as an escape shaft. The Cherry (Ill.) disaster taught the lesson of greater fire protection for mines and the fireproofing of shafts.

The purpose of mining laws is to provide the necessary protection for life and property; and when this object is attained, both miners and operators are benefited. At the present time, in Illinois, the greatest need, it seems to me, is a law that will compel operators to provide a definite quantity of air at the face of all working places. It is true that the law empowers the inspector to order the men to withdraw from the mine or any section thereof, if, in his opinion, the ventilation is such as to endanger health, and he may forbid them to again enter the mine for work until the condition is improved.

Taken as a whole, the Illinois mining law is fairly good; but, in respect to providing adequate ventilation at the working face, too much is left to the judgment of the mine manager subject to the approval of the mine inspector. If a working place is reasonably free from smoke, it is too often assumed that the air is good. It is a fact that, in many of the mines, the carbide light is used in preference to an oil lamp, simply because the circulation of air is too poor to permit of the use of oil lamps with any degree of comfort. While there are many conscientious mine managers who use the best means in their power to ventilate the mine properly, there are, unfortunately, some managers who, when a complaint is made that the air is "poor," only adopt palliative meas-

ures and strive to improve the air at the face by putting up a temporary brattice or repairing a leaky door or stopping. These are matters that should not be left to the will and judgment of the mine manager. In mines where the strictest economy is necessary, in order to reduce the cost of production and yield a profit on the coal mined, what can be expected in respect to the ventilation of the mine when the law in this regard is not specific?

One of the conditions with which coal operators of Illinois have to contend is that, owing to strong competition in the state, the selling price of coal is below the cost of production, for six to eight months of the year. The operators must then rely on cold weather to increase the demand and insure a yearly profit.

The law forbids the coal operators to combine and fix a selling price on their coal. In my opinion, the result of such a combine would guarantee to the public that the selling price of coal was just, and only what would yield a reasonable profit on the money invested. This is a matter that might well be considered, in respect to Illinois, when discussing suitable mining laws. As has already been suggested, what benefit is the Compensation Act, in Illinois, if conditions are allowed that threaten to close the mine and render the operator bankrupt? I believe the coal operators of Illinois would all agree to operate their mines under the Compensation Act if suitable protection was afforded them in the effort to maintain the price of coal.

In my opinion, it would be well if a law was enacted prohibiting the use of gasoline motors in mines. It is argued that these motors cheapen the cost of production and give greater flexibility of operation. On the other hand, it is well known that the exhaust of this class of motors pollutes the mine air and may, under possible conditions, produce a dangerous amount of carbon monoxide, the poisonous qualities of which are well known. In regard to this question, it must be remembered that conditions in a mine are quite different from those existing in a factory or other plant. While the motor is not liable to be overloaded or mistreated in other places, its misuse in the mine is a matter of common occurrence. Suppose, for a moment, there is a demand for coal and one of the carburetors of the motor is not working. Is it to be expected that the locomotive will be sidetracked until this defect can be remedied? It is safe to say that the locomotive will be used as long as it will run when the demand for coal is urgent.

Another matter deserving of attention is the political influence that is often allowed to control the appointment of members of mine-examining boards. It is unnecessary to state that every member of such a board should be able to pass any examination relating to coal mining. They should be men who possess both practical and theoretical knowledge, in respect to the mining of coal.

In regard to the examination papers being returned to the candidates, after they have been corrected by the board, I would say that the examining boards are not in-

structors, but their duty is to find out what a man knows. In this state, the candidate's papers are preserved for not less than a year, and any candidate has the right in that time to examine his papers, or to obtain a copy of the same upon the payment of a reasonable fee.

W. L. MORGAN, Instructor,
Illinois Miners' and Mechanics' Institute.
East St. Louis, Ill.

Letter No. 11—In response to the request for a full discussion of points relating to mining laws, legislation and mine regulations, that appeared in a recent issue of COAL AGE (Oct. 31, p. 698), I would like to submit a few comments on the statements made in the letters already written on this subject.

Referring to Letter No. 2, COAL AGE, Oct. 31, p. 722, I beg to differ from Mr. Parfitt, in respect to the benefit the candidate would derive from the return of his papers by the examining board. As Mr. Parfitt has previously admitted, the papers are open to examination by the candidate, under the supervision of the Department of Mines where they are filed. In considering this question, it should be remembered that the oral examination of a candidate is of greater importance in determining his practical capability than the written examination. Consequently, the return of his papers would inform him only partially on the result of his examination.

As a further argument why these papers should not be returned to the candidate, I would suggest that examiners usually manifest much sympathy in marking the papers of candidates whose elementary education has been limited. In many cases, the examiner "reads between the lines" and gives a man credit for what he evidently meant to say rather than for what he wrote.

Notwithstanding Mine Inspector Rose's sympathy with this proposal, as expressed in Letter No. 4, COAL AGE, Nov. 14, p. 799, I believe that the majority of examiners would oppose the return of candidates' papers to them, because of the fear that such a procedure would necessitate much correspondence with those who failed to pass the examination. I believe a better plan is to group the questions into proper divisions or subjects and give to each question a definite value or number of points. After the examination of the papers is completed, every candidate should be informed of the number of points he has made in each subject; as, for example, ventilation, gases, methods of working, mine laws, etc.

I quite agree with Mr. Parfitt that all members of examining boards should have the necessary individual qualifications for the position they hold, and should possess a certificate of competency or be able to present other evidence that they are so qualified. I would recommend the excellent system adopted in West Virginia, where examinations are conducted by the district mine inspectors, under the supervision of the Chief of the Department of Mines, although this system possesses the disadvantage that the work of examination takes these men, responsible for the safety of the mine, away from their duties in the field for several days and adds to their already heavy burdens.

I note, from Mr. Rose's letter, that the same system is practiced in Tennessee. I cannot, however, indorse his statement that an examining board should seek to ascertain, as far as they can by practical questions, "what the applicant knows about mining *from experience*, in-

stead of what he has learned *from others*." In my opinion, all true education is based on experience.

In mining practice, the most successful men are undoubtedly those who possess theoretical knowledge combined with practical experience. Practical mining men are prone to discount book learning and technical knowledge; and, for this reason if for no other, there should always be required of candidates, in mining examinations, a certain amount of technical knowledge.

In Letter No. 3, COAL AGE, Nov. 14, p. 798, Mr. Scholz suggests that there should be more coöperation between mine workers and their employers, in respect to the adoption and observance of suitable mining laws and mine regulations intended to safeguard the work of mining. Too often, these laws and regulations, though quite adequate if enforced, are disregarded and violated by the very persons they are intended to protect.

I cannot indorse, however, Mr. Scholz's suggestion in respect to lobbying in order to secure more intelligent and effective legislation. As Mr. Beard stated in his introductory article, COAL AGE, Oct. 31, p. 698, "Too often has mine legislation been influenced if not controlled by lobbyists whose main object and purpose have been to secure the enactment of laws that will favor their own selfish ends."

It is well known that any lobbying, in legislative halls, or "junketing" around with legislators, during sessions of the legislature or at other times, on the part of employers of labor, does not generate the best of feeling among the working classes. By no possibility can this class be led to believe that such activities, on the part of employers, are for their benefit or safety.

What Mr. Scholz has said, in respect to the Workmen's Compensation Act, in Illinois, leaves one in considerable doubt in regard to his opinion of the practical operation of this law. I would assume that he would be inclined to oppose such an enactment; and, yet, his arguments present a very strong advocacy of the need of such a law as a means of protection for both the operator and the mine worker, in the hazardous operations of mining.

The practical working of the compensation law, which has now been in operation 15 months in West Virginia, has proved an inestimable boon to mine workers and their dependents. The fund, which has been contributed to by both operators and workmen, without hardship to either party or to the trade, has made ample provision for widows, orphans and injured workmen, who would have been unable, in Mr. Scholz's own words, to have "drawn blood from a turnip."

WESVANIA.

—, W. Va.

Firing Shots in Mines

In the issue of COAL AGE, Oct. 24, p. 665, there appeared a description of a chemical fuse lighter whose action depended on the sulphuric acid introduced into one side of the tube, eating its way through a celluloid diaphragm and reaching the combustible matter contained in the tube. By this means, the fuse to which the tube was attached became ignited. This was described as taking place about two or three hours after the tube was charged with the acid, thus giving the miners or the shotfirers ample time to withdraw from the mine before the shots were exploded.

The question was asked, Is the idea practicable? While I do not doubt but that shots could be fired with this device in the manner described, the adoption of such a method in coal mining appears to me to be not only impracticable but extremely hazardous.

We will assume that the miners or shotfirers, as the case may be, have prepared the shots and charged the chemical fuse lighter with the acid and that all the men have left the mine and gone home, with the expectation that in from two to three hours the acid will eat its way into the combustible matter and ignite the fuse and the shots will be exploded. Suppose, however, that, through some fault of the acid or celluloid a longer period than what is expected elapses before the acid reaches the combustible in any one or more of the shots so prepared. It might even happen, in such a case, that the delayed explosion would take place as the workmen were entering the mine the following day.

Or, suppose again that the place where the shot was to be fired had been examined for gas, after the shot had been prepared; but, in the interval between that time and the exploding of the shot, a fall of roof had occurred, with the result that the place became charged with gas. The firing of the shot under these conditions would endanger the entire mine and, perhaps, result in a heavy property loss.

The same result might follow the firing of two shots in the same working place, as it would frequently happen that the explosion of both of the shots would take place at practically the same time. Then, the dust and gases of the first shot would be ignited by the flame of the succeeding shot and possibly cause an explosion that would extend throughout the mine.

An instance of such an occurrence causing a fatal mine explosion is given on pp. 24-6 of Miner's Circular No. 7, issued by the Bureau of Mines and entitled "The Use and Misuse of Explosives in Coal Mining." The report states: "This explosion wrecked the entire mine, dislodged timbers on the main entries, and its force extended even to the tippie 300 ft. from the mouth of the mine;" and adds, "If other men had been in the mine they would undoubtedly have been killed."

In conclusion, I wish to say that, to avoid danger in firing shots in mines, they must be prepared, loaded and fired under the supervision of a competent shotfirer. Each place must be examined for gas, and if dust is present the place should be well watered before any shots are fired. Where two shotfirers are employed in the mine they should not be firing shots at the same time, on the same split of air.

PENNSYLVANIA MINING ENGINEER.

Uniontown, Penn.

Study Course in Coal Mining

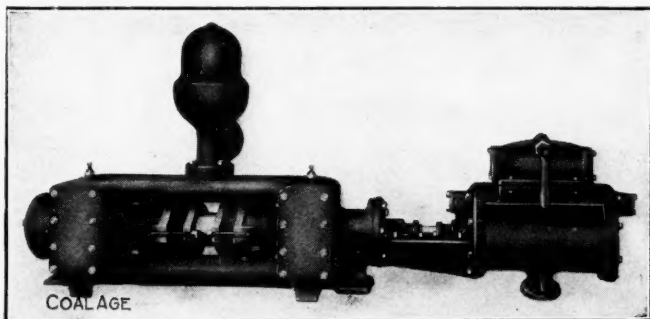
By J. T. BEARD

The Coal Age Pocket Book

The main feature and chief advantage of the **plunger type** of pumps is the elimination of most of the wearing parts in the water-end of the pump. Owing to the fact that the plunger does not occupy the entire cross-section of the water cylinder or pump barrel, there is no wear of the pump linings, as is the case in piston pumps. The wear in the water-end of all plunger pumps is confined to the packings.

As previously stated, there are three styles of **plunger packings**; namely, outside, end-packed; outside, center-packed; and inside-packed. These have each been illustrated, in detail, on a previous page.

Plunger pumps also differ in the arrangement and number of their plungers and cylinders or pump barrels. For example, a **single-acting** plunger pump has but one plunger, working in a single barrel and is outside, end-packed. A **double-acting** plunger pump may have a single plunger, working in two separate barrels, as shown in the accompanying figure, which is an outside, center- and end-packed pump, of the Cameron regular pattern.



SIDE VIEW OF CENTER- AND END-PACKED PUMP

In other styles of this pump, the plunger is operated by means of side-rods and a crosshead connection, by which the end-packing, shown in the figure, is eliminated; and the pump is then simply a center-packed pump.

Again, two plungers, connected by side-rods are operated in two separate barrels, both plungers being end-packed. This type is, in fact, a duplex, single-acting plunger pump.

The steam-end of this pump is identical with that of the piston pump, previously described. The side view here shown makes clear the manner of tightening the stuffing-boxes, by means of the bolts, as may be required by reason of the wearing of the packing. In this style of pump and, in fact, in all center-packed pumps, there is not the same tendency of the plunger to sag that there is in an end-packed pump.

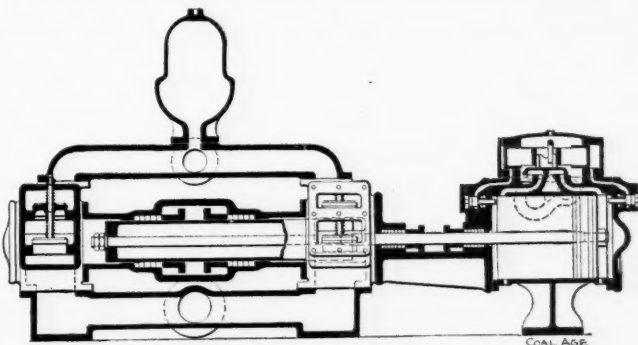
The Coal Age Pocket Book

Plunger pumps are particularly adapted to the work of unwatering mines, because of their ability to handle water containing sand or other gritty material, without the excessive wear that results in a piston pump.

Another distinct advantage that this class of pumps possesses over piston pumps is the elimination of the loss due to "slippage," which often reduces the discharge of piston pumps from 10 to 15 per cent. of that obtained in plunger pumps of the same size and operated at equal piston speed.

In this pump, the two valve chests are connected, by a pipe of ample size, with the discharge or column pipe. This connecting pipe, as shown in the figure, is surmounted, at its center, with a suitable air chamber to equalize the pressure and maintain a more uniformly constant discharge.

The figure on this page represents a complete sectional view of the pump, a side view of which appeared on the preceding page. On the right of the figure is shown the



SECTIONAL VIEW OF CENTER- AND END-PACKED PUMP

steam cylinder, surmounted by its valve chest. The water-end, on the right, consists of two separate pump barrels, in which a single plunger operates. The section shows this plunger mounted on the same rod that carries the piston, as in all direct-acting pumps.

The interiors of the two valve-chests are shown to contain, each, two poppet valves, which are held to their respective seats by springs. These valve chests are connected above and below by ample discharge and suction pipes. The section also shows the packing rings in the stuffing-boxes at one end and between the pump barrels.

The pump here shown has a stroke of 18 in. The diameter of the steam cylinder is 12 in.; while the diameter of the plunger is 6 in., which makes the size of the pump 12x6x18 in.

Inquiries of General Interest

Mixtures of Air and Mine Gases

Will you kindly explain the nature of the following mixtures of air and gases, in respect to their danger to health or as affecting the explosive condition of the mine air. These mixtures are numbered consecutively and the proportion of each gas is given in percentage.

No.	Air (O)(N)	Methane (CH ₄)	Carbon Monoxide (CO)	Carbon Dioxide (CO ₂)
1	85	15	..	..
2	30	70	..	trace
3	80	8	12	..
4	80	8	..	12
5	98	..	2	..
6	98	..	..	2

Please state what these mixtures of gases and air represent in actual coal-mining practice.

FRANK BERANEK.

Tarr, Penn.

We will explain, briefly, the character of these gaseous mixtures, in respect to their danger to health and safety in the mine, by reference to the numbers of the respective mixtures given above.

1. Assuming that this mixture has been formed by the addition of methane (CH₄) to pure air, it contains oxygen, 17.76 per cent.; nitrogen, 67.24 per cent.; methane, 15 per cent. While this mixture will dim a candle flame almost to extinction, the flame would not be extinguished unless the proportion of methane in the mixture reached 16.7 per cent. The given mixture can be breathed with impunity; since when no gas is present producing a toxic effect on the system, the first difficulty in breathing is experienced when the oxygen content has fallen to about 14 per cent.; and fatal effects may only be expected when the oxygen content is reduced to 10 per cent. The chief danger of this mixture, however, lies in the fact that it is not only explosive, but may be rendered more so by the possible addition of air.

2. Assuming, again, that this mixture has been produced by the addition of methane to pure air, it contains oxygen, 6.27 per cent.; nitrogen, 23.73 per cent.; methane, 70 per cent. This mixture is extinctive of flame, nonexplosive (though it may become so by the addition of air) and unbreathable, producing death by suffocation.

3. This mixture contains sufficient carbon monoxide to produce instant death if taken into the lungs. It is also inflammable and highly explosive. The introduction of a flame would cause its ignition and explosion.

4. Assuming, as before, that the mixture has been produced by the addition of methane and carbon dioxide to pure air, it contains oxygen, 16.72 per cent.; nitrogen, 63.28 per cent.; methane, 8 per cent.; carbon dioxide, 12 per cent. This mixture contains almost sufficient carbon dioxide to render it nonexplosive, that point would be reached were the proportion of carbon dioxide increased to 12.5 per cent., in the absence of other gases or dust. The given mixture is, therefore, feebly explosive. If breathed, such a mixture would not prove fatal, except

after the lapse of considerable time. It would, however, produce headache and nausea; and, finally, unconsciousness if the inhalation was to be continued.

5. This mixture contains sufficient carbon monoxide to produce fatal results in a brief period of time. The mixture is not inflammable, or explosive, or extinctive of flame.

6. The percentage of carbon dioxide in this mixture is not sufficient to produce any ill effects, except a slight headache or nausea, after continued breathing. It is not extinctive of flame.

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Color of Coal Ash

Will you kindly explain the cause of the difference in the color of the ash of different coals. Does this difference in color indicate a material or important difference in the composition of the coal and its value for fuel purposes? I have observed that while some coals give a red ash in burning, the ash of other coals is almost pure white. If the so called "red-ash" coal is now being mined, kindly state where it can be obtained.

CONSUMER.

Jersey City, N. J.

The color of coal ash is due to the presence of different impurities in the coal burned. The red color of the ash is the result of the presence of iron, in some form, in the coal. This iron occurs mostly as oxide or sulphide. The oxides of iron vary from bright red (hematite) to brown (limonite), in color. The sulphide of iron is the well known pyrite or pyrites, which may occur in segregated masses or nodules, or be disseminated in finely divided particles or layers, in the coal formations.

The "red-ash" and "white-ash" coals are anthracite. They are mined by the Lehigh Coal & Navigation Co. in the Panther Creek basin. According to Report 1, p. 180, of the Second Geological Survey of Pennsylvania, the names "red ash" and "white ash" were adopted by this company to designate certain coals mined from the Mammoth and Red Ash seams. It is stated that these names do not necessarily imply that the ash obtained from the combustion of these coals is always white or red in color; although, presumably, the general color of the ash suggested such designation.

Red-ash coal is handled by the Philadelphia & Reading and the Susquehanna Coal companies. The Sunday Creek Coal Co., of Columbus, Ohio, advertises a "white-ash coal." Owing to its superior hardness and resistance to breakage in handling, red-ash coal is generally higher priced. The average specific gravity of this coal, however, is given as 1.584, while that of white-ash coal from the Mammoth beds is 1.631. The average of these coals contains 3 per cent. of moisture and about 4 per cent. of volatile matter, the red-ash coals averaging 88 per cent. of fixed carbon and 4.4 per cent. of ash, while the white-ash coals average 84 per cent. fixed carbon and 8.2 per cent. ash.

Examination Questions

Hoisting Engineers' Examination, Held at Albia, Sept. 23 and 24, 1914

(Selected Questions, Continued from Last Week)

Ques.—What care should be taken of steam boilers to secure the best results, in their use?

Ans.—Boilers should be cleaned at regular intervals and carefully examined to detect any signs of weakness. The feed water should be as pure as possible and should be passed through a feed-water heater before it is allowed to enter the boiler. The water should be fed into a boiler in small quantities, at regular intervals; and care in firing is necessary to maintain an even temperature and a regular pressure. It is important to avoid any sudden changes in temperature or pressure, in boiler practice.

Ques.—What care do the various appliances of a boiler require?

Ans.—First, care must be taken that water is feeding into the boiler properly; that the feed pump is in good order and the check valves tight. The safety valve of the boiler should be tested frequently to see that it works freely and responds properly to the steam pressure. Also, the steam gage should be tested from time to time, in order to know that it registers accurately the pressure in the boiler. The water gage and try-cocks should be kept clear, so that they will show the true level of the water in the boiler. The fusible plugs should be examined frequently. It is also necessary to keep the mud drum free of sediment and the blowoff valve from leaking.

Ques.—(a) How often should a boiler be cleaned?
(b) What causes scale to accumulate on the heating surface of boilers?

Ans.—(a) The frequency with which a boiler should be cleaned will depend chiefly on the purity of the water used in the boiler. In any case, a boiler should not be allowed to go longer than a month without cleaning. In general practice, this will be too long a time and better results will be obtained by shortening this interval.

(b) The accumulation of scale on the inside of the boiler is generally greatest where the plates are most intensely heated. The scale consists of the condensed impurities of the water, which have been for the most part precipitated by boiling. The sediment contained in dirty water does not ordinarily give much trouble, as it is readily blown off from the boiler or collects in the mud drum, from which it is readily removed. The principal impurities that form the hard scale that is difficult to remove from the inside of the boiler are the carbonates and sulphates of lime and magnesia. These salts are precipitated by boiling and often become firmly attached to the boiler plates and can only be removed by the use of scrapers, drag chains and other tools.

Ques.—How can we tell what pressure is on a boiler? Explain the operation.

Ans.—The pressure of steam in a boiler is indicated by a steam gage. The most common form of gage employed,

in boiler practice, is a brass tube, flattened and bent in the shape of a horseshoe or part circle. One end of the tube communicates with the boiler; the other end being closed and free to move is connected by a lever and rack movement to the pointer that moves over the face of the dial. The pressure of the steam within the tube causes an outward movement of the free end of the tube, which movement is communicated to the pointer and serves to register the pressure of the steam.

Ques.—Which is the more dangerous steam gage, one that is "fast" or one that is "slow?"

Ans.—A fast steam gage is one that registers a higher pressure than the actual; while a slow steam gage is one that registers a lower pressure than what exists in the boiler. The slow gage is, therefore, more dangerous.

Ques.—Show by sketch how a shot should be undermined, and indicate the position of the charge of powder in the coal, assuming a uniform seam of coal 4 ft. 6 in. in thickness.

Ans.—The accompanying figure shows a shot placed in



the coal, which has first been undermined by cutting out the bottom coal to a depth almost equal to the depth of the hole. The position of the shot midway in the seam, in this case shows that the coal breaks down easily and does not adhere to the roof.

Ques.—What precaution would you take in a mine where solid shooting is practiced and the mine is dry and dusty and generating firedamp?

Ans.—"Solid shooting" should not be permitted in a bituminous mine, under these conditions. When shooting off the solid, there is every possibility of producing a blownout shot; and in case the coal is soft and friable, much fine dust will be produced that is highly inflammable.

If solid shooting, however, is to be permitted, under the conditions named, shotfirers should be employed and all shots should be fired after the men have gone out of the mine. The shotfirers should be competent miners who should examine all holes before they are charged, in order to determine the depth of the hole and the exact position of the charge in the coal. The shotfirer should have the power to condemn and refuse to fire any hole that in his judgment is dangerous. He should determine the weight of charge to be placed in each hole, and should give careful instructions in regard to tamping.

A suitable water system should be installed throughout the mine that will make it possible to thoroughly sprinkle the working face and the sides, roof and floor of every room or entry where shots are to be fired. This watering should extend from 15 to 20 yd. back from the face of the coal. No shots should be fired in places that have not been watered. The mine foreman and his assistant should see that all fine dust and slack are loaded out and the working places kept free from all accumulations of fine coal.

Coal and Coke News

Washington, D. C.

The various reports submitted to Congress by the different departments of the government are furnishing an unusual amount of information with respect to the coal situation of the country. Probably the most important document on the subject is the report of Secretary Lane of the Interior Department, who describes the situation as to the land-leasing system for Alaska as follows:

Congress supplemented its railroad bill by the passage of another act of no less significance, a bill providing for the leasing of the great coal fields of Alaska. As this is virtually the first bill to pass Congress authorizing the leasing of any of our resources, it may be well to outline its provisions. It first provides for a survey of the coal lands of Alaska, preference to be given to the Bering River, Matanuska and Nenana fields. These fields would doubtless supply the needs of the far West for many years if made accessible. The Nenana field is some 30 miles from Tanana River and could feed the great interior, while the Matanuska is but a short distance from Cooks Inlet on the coast, and the Bering River is near Controller Bay and the city of Cordova. In the two best fields (Matanuska and Bering River) a reservation is to be made for the government, not alone to supply the needs of our ships, but to be operated in the event that the price of coal is raised to such a figure by monopoly as to make this of public value. The surveys are to be in 40-acre blocks, and the leases are not to exceed 2560 acres, which is the average coal operation of the United States. As a coal mine under modern conditions is much more than a tunnel or a shaft, and requires a plant costing from a quarter to half a million dollars, it was necessary to make the acreage large enough to justify such an expenditure. The leases are to be awarded through competitive bidding or otherwise, under general regulations made by the Secretary of the Interior, with a minimum royalty payable to the government of 2c. a ton and an annual rental of from 25c. to \$1 per acre applicable on the royalty. This last provision as to rental is to make it onerous to hold land undeveloped. The leases are to be for not more than 50 years, subject to renewal on new terms.

Strict Control of Operation

The utmost care will be taken by Congress to guard against monopolization of the fields. Railroads are not permitted to hold more of these lands than will supply their own needs. Leases may be transferred only with governmental consent. No one may be a shareholder or otherwise have an interest in more than one holding. And for violation of its general and specific prohibitions criminal penalties may be imposed. Provisions against waste and for care in the operation of the mines are required in each lease. The safety and welfare of the miners are safeguarded, and an eight-hour day for underground workers is specified. Wages shall be paid twice a month, and the company store as a compulsory base of purchase is frowned on. The miners are to be insured the fair and just weighing of the coal mined, and other measures may be provided in the leases which may be needed "for the protection of the interests of the United States, for the prevention of monopoly, and for the safeguarding of the public welfare."

Leases may be forfeited by appropriate proceedings in court for noncompliance with the provisions of the lease or of general regulations, and the lease may provide for enforcement of other appropriate remedies for breach of specified conditions therein.

To care for the strictly local and domestic fuel needs provision is made that a limited license or permit, for 10 acres and running for not more than 10 years, may be granted to any person without payment of royalty. As Alaska contains many scattered coal beds easily accessible from mines and towns, this is a provision that it is thought will make for general relief. Having provided in the manner just roughly indicated against those conditions which have arisen within the United States and which have threatened Alaska, Congress has restored the coal lands of that territory to the world's use.

Alaska Dependent on British Columbia

With reference to Alaskan coal the head of the Bureau of Mines says:

The outbreak of war in Europe of August of this year had the effect of strongly reminding the people of Alaska that they are still largely dependent upon British Columbia and other countries for the coal they consume for domestic and industrial purposes, notwithstanding the fact that the territory has practically unlimited quantities of high-grade coals awaiting development on a commercial basis. It was considered possible, with the presence of warships of some of the belligerent powers in the waters of the Pacific coast, that the supply of coal from British Columbia might be cut off, thus creating a serious condition among coal consumers in Alaska, and the situation seemed to accentuate the importance of the United States having a permanent source of coal supply in Alaska, together with a coaling station that would be accessible at all times. The importation of coal from the States and from foreign countries during the last fiscal year amounted to 93,101 tons, valued at \$295,123. The importations show a slight decrease over those of the previous year, due to the more extended use of fuel oil in various industries.

Harrisburg, Penn.

If the anthracite tax law is declared unconstitutional by the Dauphin County Court it will probably be on the ground that the law is local or special legislation.

Three coal companies from the 60 appealing were picked by agreement as representing the various phases of the case. These were the Alden and the Plymouth of Luzerne County, and the St. Clair of Schuylkill County. The principal contentions of the companies were:

That special legislation is prohibited in Pennsylvania.

That local legislation is prohibited under Section 8, Article 3 of the Constitution and the Act of 1874, unless notice is published in the newspapers of the intention to introduce such local legislation. It was acknowledged that in none of the nine anthracite coal-producing counties was such a notice published in the newspapers.

The attorney general contended that as the governor had signed the bill it must be presumed that legal notice was given of the intention to present the measure, and further, that the court had no power to go behind the signature of the governor.

The coal companies asserted they are now paying a state tax on their capital stock; that of the 67 counties in Pennsylvania only nine produce anthracite; that considerable areas in these nine counties produce no coal and that these communities under the act, which provides that the state return one-half of the tax collected to the counties in which it is originated, would receive sums equal to or greater than their municipal expenditures.

In connection with the Alden and Plymouth cases it was asserted that in Luzerne County coal is mined in only 14 of the 36 townships, and that the remaining townships would receive large returns from the tax.

This is the largest tax settlement case heard in the local court in years, for it is estimated that the companies have collected upwards of \$5,000,000 from the public by increasing the price of their coal. Of this sum only \$19,000 has been paid into the State Treasury, and most of this under protest. If the act is decided to be unconstitutional the question of how this money can be returned to the people will be an interesting one.

If the court finds the act is unconstitutional, the companies will immediately appeal to the Supreme Court, and a decision may not be returned until late in 1915.

Counsel for the company urged that the act was special legislation, seeing that the state did not tax producers of semianthracite, semibituminous or bituminous coal. It was declared that the line of demarcation is slight between the various grades.

Changes in Department of Labor

Among the suggestions which the legislative committee of the State Federation of Labor received at its meeting here this week was one for the consolidation of the State Department of Labor and Industry and the Department of Mines. These matters were not put forward in the form of resolutions, but suggested for such action as the committee might determine.

The formation of a code of laws was also suggested regulating the safety and work of men employed in slate quarries and other operations not now protected by law. Steps to pass statutes covering such work were taken by the last legislature and a report may be made by the Chief of Mines, James E. Roderick.

There is a feeling among some of the leaders of the United Mine Workers for a reorganization of the State Department of Mines, so that the chief of the Department may have two assistants, one in the anthracite and the other in the bituminous region.

Tripp Shaft Disaster Not an Explosion

There are no new developments in the investigation of the accident at the Tripp shaft of the Diamond colliery of the Delaware & Lackawanna R.R. Co., at West Scranton, Bolinski, the only passenger on the cage out of 14 to escape death, declares there was no explosion, that the "carriage jerked and jerked and jerked and the men went down."

The coal company officials point out that the cage had

carried 9600 lb. many times every day, and that the combined weight of the 14 men, if they had weighed 200 lb. each, would be only 2800. One theory given was that the cage might have caught in the shaft, and that when the slack was taken up by the engineer, the bottom was ripped from the cage. Manager Phillips says that if this had happened there would have been marks on the buntoms made by the steel strips extending from the sides around the bottom. The shaft was left in such condition following the disaster that the two carriages used in it were working as well as ever a short time following the disaster, except that the cage in which the accident took place had no bottom.

Discounting the explosion stories are the facts that the timbering of the shaft was not damaged in the least; that the flooring of the cage, while broken, does not show any of the tearing and rending that an explosion would cause; that the bodies of the men found in the shaft bottom (sump), 300 ft. below where the flooring went out of the carriage, did not show any injuries or tearing around the feet, which would be natural did the dynamite explode immediately on the cage floor; that Martin Bolinsky, the man who was saved by clinging to an iron rod, was not injured about the feet, although, if there was an explosion, it must have been almost where he stood; that no smoke poured from the mine mouth after the headman heard the noise he thought was an explosion; that several sticks of dynamite were found unexploded among the bodies of the men.

PENNSYLVANIA

Anthracite

South Bethlehem—The largest diamond drill core ever cut has just been presented to Lehigh University by H. H. Otto, division engineer of the Lehigh Valley Coal Co., of the class of 1912. It was cut in the Marcy vein, at the Maltby colliery near Wilkes-Barre, Penn. The specimen is a core of an 11-in. diamond drill and the core is 10 in. in diameter. The object of the drilling was to drain some old workings at the Maltby colliery. A barrier of 183 ft. had to be penetrated before the water, which had a head of 176 ft., could be tapped. The core shows the middle rock of the Marcy vein.

Haute—It is estimated that the Harwood Electric Co., a subsidiary of the Lehigh Coal & Navigation Co., will lose half a million dollars, according to figures given out by the corporation, as a result of damage done by the storm that visited the Lehigh coal regions during the week of Dec. 14. Thirty seven of the steel towers were pulled down by the heavy coating of ice on the wires. Hazleton City has partially recovered from the effects of the storm, but many of the collieries which were supplied by the Harwood Electric Co. were forced to suspend operations.

Kingston—Inspection of mine timber which had been treated for experimental work is showing good results. In a certain place in one of the mines here where timber lasts only six months, the pit timbers were replaced with creosoted loblolly pine, and in between these timbers were placed others of the same kind of wood that had been peeled and seasoned. In the same locality loblolly pine sticks treated with lime were placed, so that they would be subject to the same general conditions. These timbers lasted about five years and all seem to be sound. At the end of the sixth year, however, the lime-treated sticks were decayed to such an extent that they were replaced with timber treated with creosote and chloride of zinc. The simple lime treatment which increased the life of the timber from six months to six years shows how necessary it is to care for mine timber and the economy of so doing, for the creosoted timbers are practically sound after seven years.

Pottsville—Pottsville, Scranton and Pittsburgh capitalists have purchased the Whippoorwill colliery on Broad Mountain, an operation abandoned many years ago. Work of reclaiming the mines will be started at once, as big coal deposits have been discovered.

It is also announced that the Madeira Hill colliery, on Broad Mountain, just opened by Philadelphia capitalists, will be placed in operation on Jan. 1, as will the East Bear Ridge colliery, owned by James Bros., of Shenandoah. These three new operations will give work to 3000 men.

Pittston—Thousands of dollars' worth of property was wrecked and several families made homeless on Dec. 14, by one of the most destructive mine caves that ever occurred in this region. The caving was unexpected and the property owners had no warning from the Pennsylvania Coal Co. Rumbling noises were heard early in the morning, and the first depression occurred a few hours later underneath a new double home owned by Michael Dunne, of Searle St., erected a few months ago at a cost of \$5000. The settling continued all through the day, creating greater damage to

the Dunne home and extending to six other houses in the vicinity.

Pittston—A tunnel driven through solid rock, at some places penetrating bodies of quicksand, and which has been in course of construction by the Pennsylvania Coal Co. for the past eight years, was completed recently. The tunnel is to be used exclusively for the draining of collieries in the vicinity of Pittston.

ALABAMA

Birmingham—The order for 175,000 tons of coal which is given annually to an Alabama coal operator by the New Orleans street railways went to the Sloss-Sheffield Steel & Iron Co. this year.

The American Cooperative Coal Mining Co. has filed a petition in voluntary bankruptcy, liabilities amounting to \$36,770.37; assets, \$45,187.40. E. H. Dryer, referee in bankruptcy, has appointed W. H. Bonham, of Collins & Co., receiver.

KENTUCKY

Barbourville—Nine Pennsylvania coal-mine operators were members of a party which has just made an inspection trip of holdings in the Clay County coal field where, it is said, the intention is to add another boundary of 12,000 acres to the original holding of 20,000 acres. In this connection plans for a railroad to run from here into Clay County are being discussed with renewed interest. Heavy investments made in this section indicate that a railroad is not far in the future.

Hazard—The Haley Coal Co., of which C. B. Slemph, congressman of the Ninth Virginia District, is president, and the Virginia Coal & Coke Co. will each make developments of its coal property on the new First Creek Branch of the Lexington & Eastern immediately below here. It is the purpose of both companies to be ready to begin shipping coal by Apr. 1, immediately upon the completion of the First Creek Branch road. The Perry County coal fields now present a spirit of increased activity, and the new year will show great prosperity throughout.

The Warner Coal & Coke Co., with headquarters at Columbus, Ohio, has leased a large area of coal lands on First Creek in the Perry County field and will soon begin the initial work looking to its development. By the first of the year, the development will be well under way. The company will ship over the First Creek Branch of the Lexington & Eastern R.R. It expects to have a daily capacity of about 12,000 tons.

Whitesburg—Orders aggregating over 90,000,000 tons of coal—perhaps the largest coal order ever placed in this country—have just been secured by the Consolidation Coal Co. in the Jenkins-McRoberts-Burdine-Dunham coal field, and a number of miners will be put to work at once. Much of this coal will go via the Carolina, Clinchfield & Ohio new line through "The Breaks" via Dante, Va., and so on to the South Atlantic ports for export to foreign markets.

OHIO

Cincinnati—The report of Capt. Charles J. Menges, trustee in bankruptcy of the Consolidated Coal & Mining Co., which is to be filed shortly in the United States District Court, will show a distribution to creditors of the company of about 5 per cent. of their claims, assets amounting to about \$12,000 and liabilities to \$72,000. The only assets of the company were the retail delivery and river equipment. The company's lease on the property at Zaleski, Ohio, operated by it under the name of the Cardiff Coal Co., was found by the trustee to be worthless, on account of arrearages on the payment of royalties and other dues.

Columbus—The Detroit, Toledo & Ironton Ry. Co. has requested the Ohio Public Utilities Commission to rescind its order, made three years ago, reducing coal rates on the Hocking Valley R.R. between Nelsonville and Toledo, on the ground that this competition made it also necessary for the petitioning road to reduce its rates between Wellston and Jackson and points in northern Ohio and Michigan to an unprofitable extent.

Bellaire—Belmont County coal mines, now closed by the strike, are likely to be operated on the profit-sharing plan. One hundred former employees of the Pittsburgh-Belmont Coal Co., whose mine is at Neff, have requested that their former employers permit them to take stock and operate the mine under lease on the cooperative plan. A similar plan has been made by the employees of the Schick mine, and the unions in other parts of the country are expected to make like proposals. The operators have the propositions under consideration, and as it offers a solution for the deadlock which has existed since Apr. 1, it is thought their answer will be favorable.

ILLINOIS

Chicago—Five large coal mines in Montgomery County, which have been under lease to the Peabody Coal Co., have been taken over by receivers appointed by Judge Carpenter in the U. S. District Court. The receivers are Francis S. Peabody, of Hinsdale, Ill.; Jackson K. Dering, of Lake Villa, Ill.; and Jabez Wooley, of Evansville, Ind. The mines of which they will assume charge are the Peabody No. 10 Mine at Nokomis, two large mines at Witt, the Kortcamp and the Taylor Springs mines near Hillsboro. Seven Indiana mines are also included in the receivership. All twelve properties have been owned or worked under lease by the Chicago & Eastern Illinois R.R., and go into receivership through orders of the court on account of the present financial condition of the railroad company. It is stated that the receivership will not interfere with the operation of the mines.

Chicago—A number of Indiana and Illinois operators, headed by C. M. Moderwell, president, Illinois Coal Operators' Association, and F. C. Honnold, secretary of that association, have placed before Secretary Lane, of the Interior Department, a statement of the appalling conditions found in the coal industry of the States of Illinois and Indiana at the present time. The salient points of this appeal are the inability of the operators to cooperate, because they do interstate business and are amenable to the anti-trust laws, and that if they could combine, they could simplify their selling and operating methods, create many economies, and prevent the present wasteful methods of mining. Cooperation would not only greatly benefit the workmen and investors in coal enterprises, but would mean the establishment of other industries connected with the byproducts of coal.

Chicago—J. B. Jones, coal operator, who recently bought out the Sunday Creek Co. in the proceedings undertaken by the government for breaking up the Eastern Ohio and West Virginia railroad combine, has applied to the Ohio Utilities Commission for leave to place a new mortgage for \$3,934,000 upon the properties of the Sunday Creek Co.

Mount Vernon—The largest coal-land deal ever made in this vicinity has been concluded in the sale of 10,000 acres south of here. The purchasers represent New York and Pennsylvania capital, and the deal was made by A. C. Snively, of Pittsburgh, Penn., with George W. Trekkeld and W. H. Green, of Mount Vernon. It is the intention of the purchasers to sink a shaft on the line of the Chicago & Eastern Illinois R.R., probably near Ina.

COLORADO

Pueblo—The Pueblo Savings & Trust Co. has filed a petition in the District Court, asking that a trust deed and mortgage held by them against the Colorado Central Coal & Mining Co., of Fremont County, be foreclosed, and that a receiver be appointed to conduct the affairs of the company. The trust deed secures a bond issue of \$300,000.

ARKANSAS

Russellville—The lease and property of the Ideal Anthracite Coal Co., operating one of the largest coal mines in this section, has been ordered sold to satisfy a judgment in the Pope Circuit Court for damages of \$16,500 for injuries received by W. F. McBride, a workman in the mines.

FOREIGN NEWS

London, Eng.—A dispatch from Stockholm, Sweden, says that the Swedish State railways have invited tenders from America for 130,000 tons of coal, to be delivered from January to March, 1915. This is the first time that American coal has been allowed to compete for Swedish State requirements.

Sydney, N. S.—The Dominion Coal Co. is grappling with the problem of securing additional markets for its output. It has been found practically impossible to compete with American operators for the South American trade, in view of the advantages enjoyed by the latter in the matter of transportation, and the war has cut the company off from a possible market in Norway and Sweden. The company has an overproduction of slack, but the blowing in of an additional furnace by the Dominion Steel Co. will enable them to dispose of a considerable amount of the surplus. The output for November was 297,407 tons, a decrease of 110,000 tons as compared with November of last year.

Tokio, Japan—An explosion occurred on Dec. 15 in a coal mine in Fukuoka, 65 miles north of Nagasaki, imprisoning 800 laborers in the workings. Present advices do not state the number killed or injured.

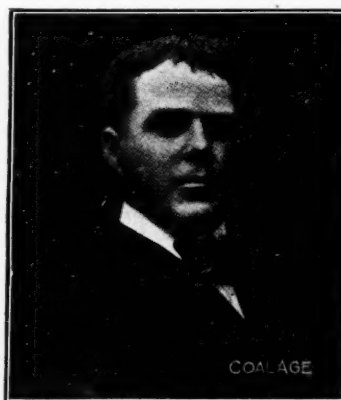
OBITUARY

George Wettengel, 90 years old, a veteran coal operator and a resident of Pittsburgh for 73 years, died at his home, 805 Kerr Ave., Dec. 11.

Henry Horn, Sr., one of the pioneer coal operators of southern Illinois, and of Perry County in particular, died at his home, on Dec. 10, at the age of 83 years. The Horn Coal Co. was one of the largest producers in the state a decade ago, but practically all of the Horn mines have been worked out and abandoned years ago. In addition to coal operating, Mr. Horn was engaged in the banking business and was president of the Horn Bank. In addition to mine holdings in this county, he was also interested in one of the mines at West Frankfort, Ill.

Daniel Francis Connor, general sales agent of Whitney & Kemmerer, died at his home, 255 West 90th St., New York City, on Dec. 10. It was not generally known in the trade that Mr. Connor had been seriously ill, and his death therefore came as a shock and complete surprise. He died of Bright's disease after being confined to the house only a few weeks.

Mr. Connor was a distinct character in the coal trade. As a young man, he was for a short time connected with the



retail trade in Boston under the firm name of Phillips & Connor. At an early age, however, he became associated with the firm of Whitney & Kemmerer in New York, and after a short time was transferred to their Boston office, but, in 1896, upon the death of Albert Darling, he returned to New York to assume charge of the business in that city. By his aggressiveness and knowledge of the business he soon forged ahead into a position of prominence in the trade, and was later admitted as a member of the firm. His genial disposition and strict

adherence to principles of business integrity formed for him a wide circle of loyal friends.

In addition to being a member of the firm of Whitney & Kemmerer, Mr. Connor was a director in the Coal & Iron National Bank, Three-In-One Oil Co. and other corporations. He was a member of the Columbia Yacht, Meridian and Railroad Clubs. Mr. Connor is survived by his wife and one daughter.

The funeral was held Dec. 12 from the Church of St. Gregory the Great and was largely attended by the prominent men of the coal trade who gathered there to pay their last respects. The interment was in Woodlawn Cemetery.

PERSONALS

A. R. Beisel, general superintendent of the U. S. Coal & Oil Co. at Holden, W. Va., has been transferred to Cincinnati, to have charge of the Huntington and Cincinnati coal docks.

Carl Scholz, of Chicago, was reelected president of the American Mining Congress; Harry L. Day, Wallace, Idaho, M. S. Kemmerer, New York, Walter Douglas, Bisbee, were chosen as vice-presidents; and James F. Callbreath, of Denver, was reelected secretary.

B. F. Hoffacker, chief assistant to the late John W. Boileau, of Pittsburgh, has taken over Mr. Boileau's office. During the period of Mr. Hoffacker's connection with Mr. Boileau he acquired a wide and varied knowledge of coal properties in Pennsylvania, Ohio, West Virginia and Kentucky.

E. H. Carr, general manager of stores for the LaFollette Coal, Iron & Ry. Co., of LaFollette, Tenn., was in Cincinnati recently for the purpose of buying a large quantity of goods of all sorts for the company's commissaries. Mr. Carr commented upon the bad condition of the iron business in his section and the South generally, stating that the company's furnaces are shut down for lack of business. He said, however, that the coal business had never been better, the volume of the movement being large and prices good.

TRADE CATALOGS

Golden-Anderson Valve Specialty Co., Fulton Bldg., Pittsburgh, Penn. Leaflet of 8 pages, 9x12 in.; illustrated.

Westinghouse Electric & Manufacturing Co. (Industrial and Power Department), East Pittsburgh, Penn. Bulletin No. 3002-A. Central station power in coal mines. Illustrated, 16 pp., 6x9 in.

Mannesmann Light Co. of America, Inc., 331 Fourth Ave., New York. Catalog. "Manlite" electric safety cap lamp. Illustrated, 20 pp., 6x10 in.

Siebe, Gorman & Co., Ltd., Westminster Bridge Road, London, Eng., H. N. Elmer, 1140 Monadnock Block, Chicago, Ill., agent for North America. "Smoke Helmets, Self-Contained Breathing Apparatus, Resuscitating Apparatus, etc." Fifty-nine pages, 8½x11 in.; illustrated.

CONSTRUCTION NEWS

Scranton, Penn.—Kingsley & Wescott have been awarded the contract to erect a breaker in Peckville for the Mid Valley Coal Co. George H. Campbell is president of this new company.

Hazleton, Penn.—After having been in the courts for years, the coal rights at Pond Creek have been sold by the owners to a New York syndicate, which will build a new breaker and develop the tract on a big scale.

Whitesburg, Ky.—The Louisville & Nashville R.R. Co. is reported to have let a contract for construction of a five-mile branch road, to run from the main line of the Lexington & Eastern R.R. at Typo to the coal properties of the Haley Coal Co. and the Virginia Coal & Coke Co. Langhorne & Langhorne, of Richmond, Va., are said to have been awarded the contract, and will begin work at once.

Louisville & Nashville engineers are rapidly locating the Rockhouse Creek branch of the Lexington & Eastern R.R. from Blackey, the new town, up Rockhouse Creek into the rich coal-land holdings of the Mineral Development Co., the Swift Coal & Timber Co. and the Rockhouse Realty Co., all three of which plan development of their property, the work to begin the first of the year. It is expected that a contract is to be let at once for the construction of this important branch, especially from a coal and timber standpoint.

NEW INCORPORATIONS

Peoria, Ill.—The McMasters Coal Sales Co. has been incorporated here, capital \$2500, by A. T. McMasters, D. A. Covey and H. C. Seward.

Tuscaloosa, Ala.—Riverside Coal Co., capital \$162,000, incorporated by John S. Riegel, of New York, R. K. Miller, of Brownsville, N. Y., and others.

Oklahoma City, Okla.—The Capitol Coal Mining Co. has been incorporated here, with a capital of \$12,000, by G. H. Fleece, R. S. Nelson and W. S. Nelson.

Cincinnati, Ohio—The Virginia Fuel Co. is being organized here for the purpose of selling the output of the Long Flame Coal Co., of Stow, W. Va., with mines on Buffalo Creek, Logan County, W. Va. When fully organized, W. J. Pritchard, of Bramwell, W. Va., will be president, and Thomas J. Burke, formerly with the Glen Alum Fuel Co., secretary-treasurer.

INDUSTRIAL NEWS

Walamun, Alta., Can.—The Walamun Power & Coal Co. has opened up a 25-ft. bed of coal of superior quality and will shortly begin shipping.

Parsons, Penn.—Thirty acres of land in Wilkes-Barre and Parsons were transferred by the Delaware & Hudson Co. to the Northern Coal & Iron Co. in a deal made known Dec. 15.

Rington, Penn.—Bennett & Randall, contractors, have completed the great No. 5 reservoir to supply water for the

Girard collieries. The capacity is 28,000,000 gal. The work was commenced in May, 1913.

Shamokin, Penn.—The coal house of the Cameron breaker of the Susquehanna Coal Co. was destroyed by fire on Dec. 13. It is believed to have been ignited by sparks from a freight-train locomotive. The loss is estimated at \$5000.

Pittston, Penn.—Fire destroyed the E. W. Wing breaker and washery at Port Griffith, near here, on the morning of Dec. 11. The plant was owned and operated by the Pennsylvania Coal Co. The blaze entailed a loss of over \$800,000 and put 2500 men and boys out of work.

Jackson, Ohio—The Detroit, Toledo & Ironton Ry. Co. has placed an embargo on all shipments of coal from West Virginia over the Chesapeake & Ohio R.R. and the Norfolk & Western R.R. This was done because of congestion at the transfer points, due to lack of equipment of the Detroit, Toledo & Ironton.

Philadelphia, Penn.—The Old Lick Run Coal & Coke Co. of this city has accepted an order for 250,000 tons of coal for delivery to South American ports, subject to the outcome of a conference to be held in London, looking to a satisfactory adjustment of credits for American coal exports in the South American markets.

Cincinnati, Ohio—The H. T. Hackney Coal Co., operating mines near Knoxville, Tenn., has changed its corporate name to the Superior Coal Co., a change in control of the company being responsible for the new name. It is announced, however, that no change in mining connections or in the selling branch here, in charge of H. L. Smith, will be made.

West Liberty, Ky.—The largest cannal coal territory in the world has been opened up by the Morehead & Norfolk R.R., which has just completed a tunnel through the mountains, intersecting the waters of Elk Fort and Straight Creek. The Continental Coal, Land & Lumber Co. has purchased a large part of this area and will begin development operations at once.

Hazard, Ky.—R. T. Hoskins and S. H. Means, of Bluefield, W. Va., have leased a good boundary of coal lands on Buffalo Creek, immediately above here, and announce its early development, the initial work to begin Jan. 1. A contract for the building of 250 houses has been let, and simultaneously with this work the mines will be opened. At least 300 men will be given work at the start.

Shickshinny, Penn.—Because two electricians' helpers were discharged when they refused to do the work of master workmen, 1200 employees at the Moconagua colliery of the West End Coal Co. went on strike Dec. 13, and the colliery will be shut down until the grievance can be adjusted. The colliery employees contend that the two helpers were forced to perform work that requires a master electrician and that the apprentices were right in refusing.

Washington, D. C.—Formal announcement of successful naval tests of coal from government-owned Matanuska fields in Alaska was made Dec. 14, by Secretary Daniels, before the naval committee of the House. Trials by the cruiser "Maryland," Mr. Daniels said, had determined that the Matanuska coal was as good as any to be found and pointed the way to an adequate supply of fuel for the Pacific coast as soon as transportation facilities are available.

Lexington, Ky.—Charles Swetner, vice-president of the East Jellico Coal Co., has announced that his company has contracted for sale to the Russian government of 50,000 tons of coal to be delivered at Odessa, on the Black Sea. The company, which has mines at Shaffer, Ky., and Bluefields, W. Va., will ship from Bluefields. Mr. Swetner said that he did not think this coal would be contraband, as it was to be used for commercial and domestic purposes.

Hemphill, Ky.—White L. Moss, M. J. Moss and others, of Pineville, Ky., have just leased a large coal-land tract on the Yount's Fork branch of the Lexington & Eastern R.R. near here, from K. S. Potter, and make the announcement that development of the property will be begun soon after the first of the new year. White L. Moss will be general manager. The company will have a daily output of about 1200 tons from the beginning, and the plant is to be electrically equipped.

Lansford, Penn.—The Lehigh Coal & Navigation Co. has been experimenting with a new device manufactured by the American Concentrator Co., that automatically reduces the quantity of coal in the slate discharge. This apparatus has been in operation on a Joplin jig at the Greenwood washery for over a month, with marked success, and will be attached to the other jigs in the washery as well. Before the device was adopted the jig-runner was forced to watch the discharge continually and put his hand in the water to ascertain the height of the slate. This was trying, especially in cold weather. With this apparatus the action is entirely automatic.

Coal Trade Reviews

General Review

Cold weather creates a sharp advance in anthracite though the wholesale market continues heavy. Bituminous operators still pushing vigorously for business. What few changes there are seem to be of a constructive nature.

The first severe cold snap of the season appeared at the beginning of the current week, creating great activity in retail circles the effects of which were felt in the wholesale business though mining operations have not been increased as yet. The change has come just in time to avoid a severe slump in the market, and even now it will take some little time to clean up the excessive accumulations and put the trade on a firm basis. The Lake movement to the Northwest has been fully 20% less than last year, but the upper Lake ports are well supplied, partly because of the heavy stocks carried over from last season. The mines continued on curtailed running schedules this week, but full time operations will probably go into effect next week.

The heavy storms of last week, resulting in the complete loss of some vessels and long delays to all the others, has created a temporary stringency among bituminous consumers dependent upon regular and continuous shipments, which has afforded an opportunity for the agencies to urge additional tonnages upon buyers. However, the technical position of the market continues on the same unsatisfactory basis with operators vigorously pushing for business. While occasional plants are working full time on war orders, it cannot be denied that the New England trade as a whole is doing scarcely better than two-thirds the normal business. Ocean freights on export shipments continue at the same high level, or higher, with the result that there is still less being done in this direction though rates are somewhat easier to the West Indian trade where return cargoes of sugar will soon be available.

Considering the adverse effects of the final and complete elimination of the Lake business, operations in the Pittsburgh district continue relatively strong, but there is still an absence of inquiry on new contracts, and the circular is not well defined. There seems to be less disposition to buy ahead than in former years, but what little change there is, seems to be of a constructive nature. It is generally agreed that most concerns are running on light stocks.

The colder weather has created a better tone in Ohio, and the producers are showing less tendency to crowd the market at the prevailing low prices. Expiring contracts as a rule, are not being renewed, buyers covering their immediate requirements in the spot market, the tendency being to hold off until after the first of the year on any new business. In the Southern markets the domestic demand seems somewhat better at the moment, though prices are substantially under the circular as compared with steam coal which is holding close to the regular schedule; collections are bad.

In the Middle West the colder weather has started the most important movement of the year, and shows indications of a still more active demand for the domestic grades in the near future. Screenings continue to lead the market. With winter weather conditions now in effect there will be a strong, healthy undertone through the market, but negotiations will generally be delayed until after the first of the year.

ATLANTIC SEABOARD

BOSTON

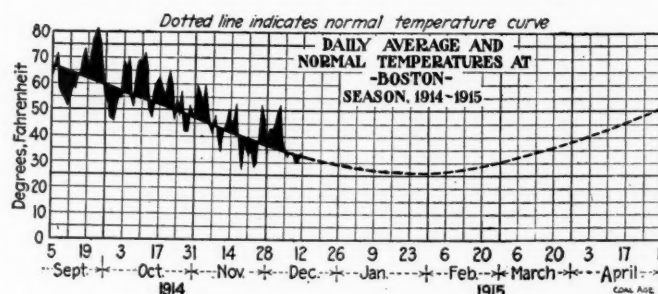
A slight spot demand for Pocahontas and New River, but f.o.b. prices unchanged. No let-up in anxiety to move coal. Pennsylvania grades still meet with only scattering demand. Slightly better call for anthracite, although independents still make concessions on slow sizes.

Bituminous—There has been some interest this week in spot coal on the part of buyers, but it has been due to the weather conditions and the slow movement of transportation along the coast. Cargoes have been held up by fog and storm for ten days or a fortnight in some cases, and some few of the consumers, dependent on an uninterrupted supply, have been pinched for coal. If general market conditions were not so

dull and flat this would hardly be noticed but it is eagerly used by some of the shippers to induce contractors to accept deliveries a little faster.

The weather is now more seasonable; the Kennebec River has frozen over, and the trade is beginning to settle down to winter conditions, even though accumulations at the Hampton Roads terminals are as large as ever. No contracts of any moment have been placed since last report and there is nothing new on prices; \$2.85 continues the nominal basis, but such sales as are made are well down to \$2.70 or less.

Pocahontas and New River shippers are vigorously canvassing for business, spot and future, but it will be several months before New England buyers are interested unless there is a marked change in industrial conditions. Scattered plants, mostly textile and shoe, have large foreign orders that keep them running at full capacity but by far the larger number of mills and factories are on two-thirds time. In the spring these interests contracted for a normal tonnage of coal and hence it is that stocks everywhere are large.



"Market cargoes" have been conspicuous by their absence during this after-storm period and those now arriving will probably command slightly higher prices. It depends, however, on the volume of coal whether on-car prices at Providence and Boston will show a material advance. Portland was actually short of steam coal this week until an over-due steamer arrived.

The steamer "Carolyn," lately a coastwise collier, was chartered to take cotton from Savannah to Bremen, Germany.

The storm interfered with receipts of Georges Creek in this territory and it will probably be several weeks before the shippers catch up with their orders.

The better Pennsylvania grades continue only in light demand. Prices are at a minimum level, with operators holding their output down to what the market will absorb. All-rail movement is slightly better but at Tidewater the demand is still only scattering.

Anthracite—There has been a little start in the local demand for anthracite, but it is of a hand-to-mouth character. The retail dealers feel it is easy to get coal forward on short notice and they are not trying to be forehanded. The shipping companies are able to load all sizes promptly, so much so in fact, that independents are offering egg and chestnut at 25¢ below the circular.

Current quotations on bituminous at wholesale are about as follows:

	Clearfields	Cambrias Somerset	Georges Creek	Pocahontas New River
Mines*	\$0.85@1.45	\$1.15@1.55	\$1.67@1.77	
Philadelphia*	2.10@2.70	2.40@2.80	2.92@3.02	
New York*	2.40@3.05	2.70@3.15	3.22@3.32	
Baltimore*			2.85@2.95	
Hampton Roads*				\$2.50@2.75
Boston†				3.48@3.78
Providence†				3.43@3.73

* F.o.b.

† On cars.

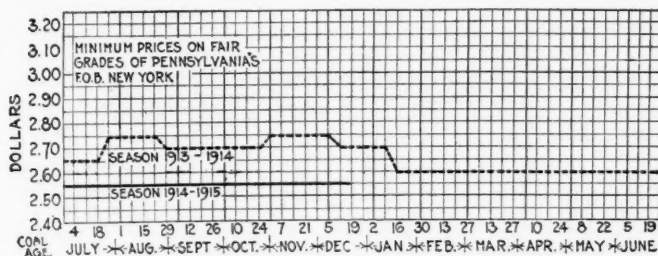
NEW YORK

Bituminous buyers still indifferent. Some preliminary negotiations on new contracts. Severe cold weather checks the decline in anthracite. Retail trade active.

Bituminous—Buyers continue indifferent and the trade is still awaiting some new developments, such as a general re-awakening of industrial activity. The usual slowing up that always marks the holiday period is already being felt and no great activity is anticipated now until after the first of the year. The bunkering trade does not seem so heavy at the

moment, and mine operations continue on about the same basis, that is, 60 to 65% capacity.

The embargo put into effect at South Amboy last week was raised on Thursday of the same week, but with the appearance of severe cold weather it is not unlikely that it will be reestablished. When the embargo was originally declared, it is reported that all of the sidings on the Pennsylvania R.R. were practically choked up with coal, most of which was said to belong to the Berwind-White Co. While the embargo was essentially due to the delayed water movement, due to the heavy storms, it was probably somewhat aggravated by the reduction of the train crews on the railroads, which is in line with their general curtailment policies.



Negotiations on new contracts are not yet under way, but tentative figures are being made at the same level as last year; it seems doubtful at present if these will hold, and it is probable that concessions of 5 to 10c. per ton may be found necessary. A few cargoes of demurrage coal can occasionally be picked up at low figures, but as a rule this has been well cleaned up and the nominal market continues essentially on the same basis, as follows: West Virginia steam, \$2.35@2.55; fair grades, Pennsylvania, \$2.55@2.65; good grades of Pennsylvania, \$2.70@2.80; best Miller Pennsylvania, \$3.10@3.15; Georges Creek, \$3.15@3.25.

Anthracite—The first really severe weather of the winter appeared the early part of the current week and undoubtedly saved the anthracite market from a more or less complete demoralization. So far the effect has not extended beyond retail circles, but there is great activity in that branch and dealers are particularly well pleased that the buying movement was started before the snows made deliveries slow and expensive. It is not to be expected that the change will affect mine operations immediately, but the importance of the weather on the anthracite market is generally recognized by all, and the trade is watching temperature conditions with a critical eye.

There is no change of importance noted in the wholesale situation as yet. Reductions are still necessary to move egg coal, while stove is plentiful in all directions and can now be obtained at 10c. under the circular. Nut and chestnut are about the only sizes in any demand at all at the present time. The steam grades continue in the same rut as for the past several weeks. Mine operations were still curtailed during the current week, but a continuance of the low temperatures will soon necessitate full-time schedules.

We continue the market quotations on the same basis as last week, with the exception of stove coal, which is 10c. lower, as follows:

	Upper Ports		Lower Ports	
	Circular	Individual	Circular	Individual
Broken.....	\$5.10	\$4.60@5.10	\$5.05	\$4.55@5.05
Egg.....	5.35	5.00@5.35	5.30	4.80@5.30
Stove.....	5.35	5.25@5.35	5.30	5.20@5.30
Chestnut.....	5.60	5.45@5.60	5.55	5.40@5.55
Pea.....	3.55	3.45@3.55	3.50	3.35@3.50
Buckwheat.....	2.80	2.50@2.80	2.50@2.75	2.15@2.75
Rice.....	2.30	2.20@2.30	2.00@2.25	1.35@2.25
Barley.....	1.80	1.60@1.80	1.75	1.25@1.75

BUFFALO

Bituminous gaining slowly. Slack doing better than sizes. Weather too mild for an active anthracite trade. Lake season ended.

Bituminous—What little change there is in the situation seems to be in the direction of an improvement. Slack is selling freely and promises to be strong in the near future; there is less surplus than usual which will be noticed as soon as the Lake business is out of the way and the trade settles down for winter business.

Canada, which has taken little coal for the past year, will probably start up soon, as they have large orders for goods for the British army; our factories are also feeling a decided improvement in the same direction and it looks as if the industrial depression might soon be over. There seems to have been less disposition to buy ahead than for some time; it is also well known that the railroads have light stocks everywhere and should they start buying there would be a lively rush for coal.

There are some good contracts offering now and the report is that quite as good prices are in prospect as were obtained a year ago. Current prices are slightly stronger, on the basis of \$2.80 for Pittsburgh lump, \$2.70 for three-quarter, \$2.55 for mine-run and \$2.15 for slack. Only best grades bring these prices, but the market is much less demoralized than it was during the fall.

Anthracite—The market is quiet, but with the return of winter weather the demand is stronger and the trade will soon show increasing activity. The surplus of egg coal continues, but the demand for stove and chestnut is not so strong as in former years.

The Lake season closed with a total shipment of 4,286,226 net tons. The amount for the previous season was 5,133,696 tons, which was the largest on record. As a rule the shippers were satisfied with the amount sent forward, most of them closing down before the Lake fleet was all out of the market. On account of the excess of egg some of the companies have taken considerable tonnage for immediate loading to hold during the winter. Three or four cargoes are already loaded.

PHILADELPHIA

Cold snap causes additional demand for coal. Collieries operating more freely. Bituminous about the same as last week, although there seems to be a better feeling in the trade.

Anthracite—The cold snap the early part of the current week caused an increased demand for coal from the retailers, which was naturally reflected in the requisitions on the wholesalers. Operations were much curtailed last week, some companies suspending two or three days, and it will require more than a week of cold weather to place the trade on a normal basis. All the dealers seem to have ample stocks, and they are rather chary about selling to everyone that comes along.

There is no doubt that the industrial depression has had an unusual effect on the demand for coal. Dealers are sometimes pressed with requests for coal, but when the question of credits comes up, the order is in many instances turned down; credits have been closely scrutinized during the last year or two, as many of the dealers have suffered heavy losses. Prices at retail still continue at \$7 for egg, \$7.25 for stove and \$7.50 for nut, notwithstanding the implied threat on the part of the retailers to advance quotations 25c. all along the line. Pea coal retails at \$5.50 per ton.

Prices at Tidewater remain about as follows:

	Circular	Individuals
Broken.....	\$4.75	\$4.50
Egg.....	5.00	4.75@4.85
Stove.....	5.00	5.10
Chestnut.....	5.25	5.25

Bituminous—The cold weather is likely to cause a temporary improvement in the demand for soft coal, but the general apathetic condition of the trade still continues. Here and there better reports are heard, but, taking the situation as a whole, no improvement is noted.

BALTIMORE

Bituminous still on unsatisfactory basis. Colder weather stimulates some interest. Anthracite livens up a bit.

Snow, sleet and freezing weather in many sections of Maryland, West Virginia and Pennsylvania have affected the situation materially. Much of the coal arriving at tide was weather bound, and the rail movement was more intermittent also, though there was no scarcity of fuel at any time.

West Virginia fuels are offering at from 75 to 90c. The call for three-quarter gas has continued particularly poor. Pennsylvania low-grade coals were offered freely around 90c. to \$1, with medium to best grade at from \$1.10 to \$1.35. Western Maryland steam coals are in poor demand and were quoted at the mines around 85c.

Local dealers report a better demand for hard coal, the market being regarded as a strictly weather affair. Steam grades are still decidedly lacking in strength.

A marked increase in the number of export charters has given hopes that the December total for foreign movement might be considerably better than has been expected. Coastwise shipments, except in company-owned or long-term chartered vessels, remained dull and featureless.

Contract renewals that come into the market at this time are being taken up generally on about the same basis as last season. There may be some cutting in larger amounts, but the trade as a whole is standing firm behind its former figures despite the depressed state of the market.

HAMPTON ROADS

Demand continues light on all grades. Heavy weather has interfered seriously with coastwise movement.

Dumpings at Tidewater are hardly coming up to expectations. The severe storms have interfered to some extent with all classes of vessels. Steamers loaded for Northern

ports last week should be back for new cargoes now but have been delayed in passage both ways; this has, of course, caused some falling off in dumpings at the various piers, and to date the total tonnage at all piers is probably less than last month. Coastwise shipments, as usual, have gone principally to New England ports although there has been a small movement to Charleston and Jacksonville.

Circular prices are being maintained even though the demand on all grades is light. The accumulation of cars in the railroad yards is still above normal and while a few shippers are short of coal, others have a large surplus. The accumulations are mostly due to the weather conditions, and it is expected that this will clear up shortly.

Clearances during the interval, Dec. 8 to 11, were as follows:

Vessel	Destination	Vessel	Destination
Harewood	Genoa	Posteiro	Pernambuco
Finn	Gibraltar for orders	Stephen	Para and Manos
Atlantide	Porti Ferazzo, Italy.	Tibagy	Rio de Janeiro and Pernam- buco
Hermod	Canal Zone	Fanny	Buenos Aires
Bjorn	Santiago		

OCEAN FREIGHTS

Rates continue advancing and American operators are practically excluded from foreign markets. West Indian situation easing up.

The freight market continues to advance. Owners seem to be able to secure about any rates they ask on grain, cotton, general cargo and time charter trades. There is little business in export coal, as Americans find it difficult to compete with Cardiff at the present differential in rates.

Two large sailing vessels have been chartered for coal (one from Norfolk and the other from Philadelphia) to Rio at \$5.50 U. S. gold per ton. Steamers can be secured at fairly favorable figures for Cuban and West Indian trades, as these cargoes combine with Cuban sugar home, which will soon commence to move.

To	Rate	To	Rate	To	Rate
Havana.....	\$1.70@1.80	Kingston†.....	\$1.85@2.00	Tampico.....	\$2.25*
Cardenas††	1.90@2.10	Curacao.....	1.75	Rio.....	5.52@6.00
Cienfuegos....	2.00@2.25	Santiago.....	2.00@2.10	Buenos	
				Ayres**	5.40@6.00
Port of Spain.	2.25@2.50	Guantanamo.	2.00@2.10	Mediterra- nean.....	7.20
St. Lucia.....	2.25@2.50	Demerara.....	3.00		
St. Thomas...	1.80@2.00	Bermuda.....	2.00@2.10		
Barbados.....	2.25@2.50	Vera Cruz....	2.25*		

*About. †Small boats to Kingston \$2.00@2.10. **Or La Plata. ††Or Sagua. W. W. Battie & Co.'s Coal Trade Freight Report.

COAL CHARTERS

Coal charters have been reported by the "Journal of Commerce" as follows:

Vessel	Nationality	From	To	Tons	Rate
Haugarland	Norwegian	Virginia	Italy	2718	
Ortrud (bark)	Italian	Virginia	Italy	1402	
Edith		Philadelphia	Charleston	1051	
Wm. E. Downes		Baltimore	Mayport	629	
Oceanica	Italian	Philadelphia	Italy	2717	
Primo	Italian	Philadelphia	Italy	2245	
Timandra (ship)		Norfolk	Rio Janeiro	1487	\$5.50
Francis Hanify		Atlantic Range	San Francisco	1084	4.95
Olson & Mahoney		Atlantic Range	San Francisco	799	4.74
William C. May		Philadelphia	Jucar	607	2.00

Note—Steamers are indicated by bold face type, all others being schooners.

OHIO VALLEY

PITTSBURGH

Operations continue at under 40% capacity, with demand no better except in domestic, which has been favorably affected by a cold snap. Prices very irregular.

The general demand for coal has reflected no improvement to speak of, and mine operations continue very light, averaging less than 40% of capacity. Considering, however, that the Pittsburgh district always suffers a severe curtailment after the close of the Lake shipping season, even when general demand is good, the condition is not as distressing as might otherwise be assumed. Railroad demand is probably not much over 60% of normal, while demand from manufacturers, almost wholly against contracts, does not seem to be more than 40% of normal. Domestic demand has experienced a further improvement this week, there having been a heavy snowfall Sunday, accompanied by a drop in the thermometer to the twenties while by Tuesday morning the zero point was touched.

Prices continue irregular for free coal, and there being no inquiry to speak of for contract coal the operators have no fixed schedule. Slack is fairly firm at 80c., but otherwise the following quotations represent little more than the level from which cutting begins, though some operators are holding firmly to these or higher prices, and booking correspondingly

little business: Slack, 90c.; nut and slack, \$1; nut, \$1.10; mine-run, \$1.15; ¾-in., \$1.25; 1¼-in., \$1.35, per net ton at mine, Pittsburgh district. The prices on screened coal are to consumers, dealers being usually given a concession of 10c.

COLUMBUS

Colder weather again stimulates the domestic trade and a better volume of business is expected. Demand for small sizes is increasing. Steam trade continues dull.

The lower temperatures have had a stimulating effect on the local trade. While the increased volume of business is slight, it has given a decidedly better tone to the market. The domestic trade was affected more than any other department, the steam business still being dull and there is little hopes for immediate improvement.

Prices are no better and it will require several weeks of the increased business to have any effect upon quotations. Prices still continue a little under the circular which is still in force. The small sizes are the only ones showing an advancing tendency, nut, pea and slack and coarse slack all being stronger.

The steam trade is dull in every way and there is little hope for improvement in the immediate future. Manufacturing has not been greatly affected by the large number of war orders which are said to have been placed here. Railroads are not taking any large amount of coal. Buying is still being done on the open market where contracts have expired.

Dealers' stocks are not large as a rule, although there are a few exceptions. Collections are still bad which is affecting orders from the dealers. Prices in retail circles are fairly strong despite the weakness in other lines.

Production in Ohio fields has been on the following basis: Hocking Valley, 60% normal; Pomeroy Bend, 75@80%; Crooksville, Cambridge, and Jackson, 60% of the average.

Prices in the Ohio fields are:

	Hocking Valley	Pomeroy	Kanawha
Rescreened lump.....	\$1.55	\$1.65	.....
Inch and a quarter.....	1.50	1.55	\$1.40
Three-quarter inch.....	1.35	1.40	1.35
Nut.....	1.15	1.25	1.15
Mine-run.....	1.10	1.15	1.10
Nut, pea and slack.....	0.60	0.60	0.55
Coarse slack.....	0.50	0.50	0.45

TOLEDO

Toledo trade brisk and prices firm. Orders coming in better and the trade more hopeful.

The weather conditions have greatly stimulated the domestic trade and dealers are much more hopeful. Orders are coming in well and prices are holding firm. There is practically no coal on track. The docks are cleaned up also, being left in better shape than is customary. The Lake shipping is now over for the season. Orders are coming in well both for domestic and steam coal and dealers are optimistic over the outlook.

CLEVELAND

The retail trade active due to the colder weather. The effects not yet felt by jobbers and operators. The market firm, but not active.

Slack is being held at 5c. above last week's prices in most instances, but coarse coal is selling at anything it will bring; this is due to West Virginia No. 8 operators selling three-quarter coal on consignment. This coal has been coming into the market when it was the weakest and though only 15 to 20 cars arrive at one time, it has kept other fuels at below cost. Some of this No. 8 has been sold in competition with mine-run.

The tone of the slack market is shown in the prices asked for Hocking. Ohio slacks are firm at \$1.65@1.70 on track here while Fairmount is being sent to other markets and Pennsylvania coals are too high priced to compete here. Youghiogheny is being sold at 80 and 85c. at the mines.

No more coal will be loaded into vessels for delivery this season. The steamers "Rees," "Yosemite," "Sonora," "Capt. Thomas Wilson," "H. W. Oliver," and the "W. H. Wolf," left Lake Erie ports for Milwaukee on Friday and Saturday of last week. The "Wolf" was a week late in reporting for her cargo at Cleveland and the "Rees" was two days ahead of her schedule at Lorain. A block of 500,000 tons of soft coal, for delivery at Superior next season, was placed with a local vessel company last week at 30c., the same rate that prevailed this season.

Prices for shipment are as follows:

	Pocahontas	Youghiogheny	Bergholz	Fairmount	W. Va. No. 8
Lump.....	\$3.35	.....	\$2.45	.....	.....
Lump, 6 in.....	.....	.....	.....	.....	.....
Egg.....	3.35	.....	.....	.....	.....
Egg, 6 in.....	.....	.....	2.10	.....	.....
Lump, 1½ in.....	.....	\$2.40	2.25	.....	.....
Lump, 1 in.....	.....	2.30	2.10	\$1.95@2.00	\$1.95@2.00
Mine run.....	2.55	2.25	1.95	1.85@1.90	1.90
Slack.....	2.40	1.80@1.85	1.70@1.75	1.85@1.90	1.80

CINCINNATI

A week of colder weather has improved the demand and better prices are in evidence. Contracting continues slow, but the tone of the market is more favorable, and operators are less inclined to push for business.

Real winter weather, with considerable snow for the first time this season, has created some activity in the trade, particularly the domestic market. Retailers are buying more readily, although not in large quantities. Prospects seem good for better prices and operators are less inclined to crowd sales at current figures.

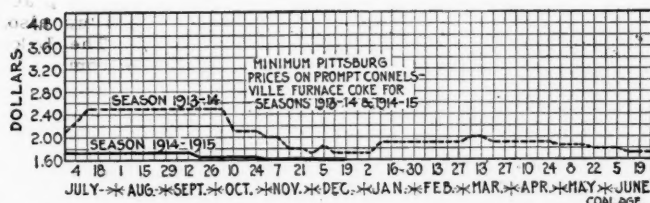
Contrary to expectations, there has been comparatively little buying on contract, because of the continued dullness in most industrial lines. The tendency is to wait for new developments until after the first of the year. Improvement is noticeable in the iron and steel trades, indicating that conditions may be better shortly. A large volume of river coal is expected in this market shortly, which will give considerable relief to handlers of this grade, whose supplies are almost exhausted.

COKE

CONNELLSVILLE

Furnace coke contracting under way, with about 100,000 tons a month closed, 50,000 to 75,000 tons under inquiry, and 50,000 tons or more not heard from. Prices steady and unchanged. Production and shipments partially recovered from the holiday week.

Contracting for furnace coke for next year's requirements has continued active. In last report the contracts closed were summarized as involving 50,000 tons a month, and since then additional contracts have been closed making the total 90,000 to 100,000 tons a month, first-half contracts predominating, full year contracts coming next, with two contracts closed for two years and one for a quarter only. About two-thirds of the business has been at flat prices, particularly that most lately closed, at \$1.65 to \$1.70 for the quarter, about \$1.70 for the half-year, and in exceptional instances at \$1.75 for the second-half. In one case \$1.65 was done for first-half and \$1.75 for second-half, but this is considered exceptionally low. Inquiry now out totals 50,000 to 75,000 tons, and most of this business is likely to be closed shortly.



There remains 50,000 tons or more per month of business now being filled on contracts, expiring at the close of this month with consumers who have not put out fresh contracts, while there is of course a much larger quantity of possible consumption involved in furnaces now idle that may resume next year, but cannot contract for their possible requirements now. The operators would not think of selling at present prices to a furnace that would only resume in case conditions improved. Foundry coke is very quiet. The annual contracts generally run from July 1 to June 30. We quote: Prompt furnace, \$1.60; contract furnace, first-quarter, \$1.65@1.70; first-half, \$1.70; prompt foundry, \$2@2.20; contract foundry (nominal and for best grades), \$2.35@2.50, per net ton at ovens.

The "Courier" reports the production in the Connelville and lower Connelville region in the week ended Dec. 5, at 195,575 tons, an increase of 16,136 tons, and shipments at 196,157 tons, an increase of 19,408 tons. These increases, however, merely represent a partial return to the rate obtaining prior to the previous week, when the Thanksgiving Day holiday cut into production and shipments.

BUFFALO

The demand for coke has not improved and there is no stir in prices. If the reports of orders for steel manufactures from Europe continue there will be an increase of demand after a little, but such reports usually need confirmation. It is felt that the up turn cannot be far away and some of the idle smelting furnaces here are starting up. Coke prices are still based on \$4.25 for best 72-hr. Connelville foundry and \$3.30 for stock coke.

BIRMINGHAM

There is absolutely nothing new in the coke market.

CHICAGO

The coke trade has improved. A number of contracts have been renewed, and large shipments are being made on old engagements. Byproduct coke is about the same, being influenced by the domestic trade demand. Current quotations are as follows: Byproduct, \$4.75@4.95; Connells-ville, \$4.75@5; Wise County 72-hr. (select), \$5; gas coke, \$4.50@4.75; furnace coke, \$4.50@4.75.

ST. LOUIS

There is practically nothing doing on foundry coke, and not much anticipated until the railroads begin to get in the market for supplies. A small amount of byproduct coke is coming in, chiefly for domestic purposes, and the local gas house coke is moving slow; some of the latter is being shipped out of the city, but not to any extent.

THE STEEL INDUSTRY

Slowing down over year end but some buying ahead. Expectations of a wage cut.

Buying of finished steel for the first quarter of 1915 has increased somewhat, but it is evident that December will not put on the books the volume of new business needed for a strong revival of mill operations after Jan. 1. The last two weeks of the year, from all signs, will take their usual quiet course.

The possibility of wage and salary reductions at the beginning of the year is again having attention, since it became known that no stock offerings to employees will be made by the Steel Corporation, and with the expectation that there will be no bonus distribution. Counting against wage reductions are the improvement in financial and security markets and the better railroad buying looked for after the generally predicted advance in Eastern freight rates. On the other side are the poor balance sheets of the year and the indications that profitable iron and steel prices are some months distant.—"The Iron Age."

SOUTHERN

BIRMINGHAM

Steam and lump grades continue quiet. Blacksmith coal improving.

The past week has shown little change in the lump coal market, though the movement may be slightly better. Steam coal is in some better demand, but the increase can hardly be noted. Prices on lump coal are about 50c. under the schedule, while steam coal is only slightly under the regular circular. Blacksmith coal is increasing in tonnage, with prices the same. The furnaces report a heavy sale of pig-iron covering the first half of 1915.

LOUISVILLE

Steam market shows some improvement and there is none on demurrage. Domestic continue heavy and collections are slow.

An improvement in the steam coal market is the most notable event in the Kentucky field this week. For the first time in a long period there is little or no steam coal on demurrage and orders are more plentiful. The domestic market has not shown a great deal of improvement in spite of the cold weather.

Though a large proportion of the eastern Kentucky mines are closed down, others are running better than the western Kentucky operations, which are doing only about two days a week. Highest grade block coals are bringing from \$1.75 to \$1.90 f.o.b. mines, with prices ranging downward on all other grades. High grade nut and slack commands from 50 to 60c. and the poorer grades from 25 to 40c. f.o.b. mines.

MIDDLE WESTERN

CHICAGO

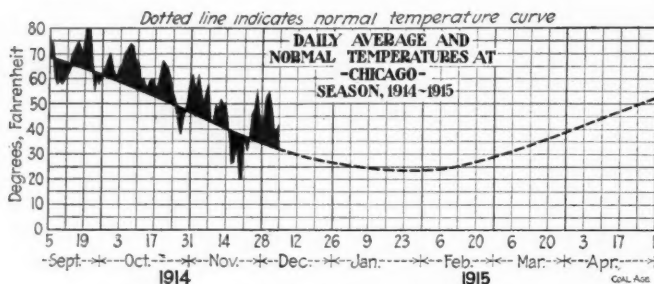
Seasonable weather lends encouragement, but prices for domestic coals are irregular. Householders buying only sufficient for immediate needs. Screenings strong. Anthracite steady.

Colder weather has again appeared and indications point to a more active demand for domestic sizes. The tendency in screenings is still upward, and prices have reached the highest level for several months past; some screenings have been sold at 80c., and the average price has been around 70c.

It is freely predicted that a continuation of present conditions will see screenings averaging from 80c. to 85c. per ton in a short time; this is due to the increased demand and the curtailment of output.

The improvement in domestic demand is slight, although the cold weather has increased the buying. Householders continue to purchase only current requirements, which has had its effect on the retail yards. The Central West is now covered with snow, and it only needs the continuation of wintry weather to give a healthy tone to domestic and coarse sizes.

In anthracite there has been a shortage of chestnut coal in this market which has been overcome the last few days by increased shipments. The demand for stove and egg is about equal to the receipts; prices are holding steady at circular quotations.



The Sullivan County and Clinton district mines in Indiana are shipping most of their domestic coals to the local trade at fair prices, and are disposing of their screenings at an increase of 5c. to 10c. per ton over the prices of last week.

In Franklin County there has been a recession in prices except for screenings, and very few of the operators are receiving circular figures for domestic coal. The variation in prices is wide, and shipments of coarse coal have been accumulating at the mines awaiting disposition.

Smokeless lump and egg is in good demand, but there is practically no call for mine-run.

Little activity is shown in splint coals, and prices average 25c. to 35c. below the list.

A slight improvement is reported in prices for Hocking coals owing to the decreased production; demurrage coal has all been absorbed.

Carterville grades are steady, and operators in that field are making an absolute minimum of \$1.60 for No. 1 washed coal, while most of the sales are at \$1.75.

In the Springfield district the mines have been operating steadily and screenings are particularly strong. Some of the mines in this district are shipping egg and nut coal to the steam trade at the same price prevailing for steam lump fuel.

PRICE QUOTATIONS IN THE CHICAGO MARKET

	Franklin Co.	Springfield	Harrisburg	Sullivan	Clinton	Carterville	Green Co.	E. Kentucky	N. Riv. & Poca.	Somerset	Hocking
Lump.....	\$1.50@1.75	\$1.50	\$1.50@1.75		\$1.50@1.60	\$1.50@1.75		\$1.50@1.75			
4-in. lump....				\$1.50@1.60			\$1.50@1.35				
Steam lump...					1.15@1.20						
2 1/2-in. lump..				1.50			1.30@1.40				
1 1/2-in. lump..				1.20@1.35							\$1.40@1.50
Lump and egg									\$2.25	\$2.25	
Mine-run.....	1.15@1.25		1.20@1.30		1.10		1.10		1.25@1.40	1.25@1.40	1.25
Egg.....	1.40@1.50		1.50@1.75		1.50			1.35@1.50			
No. 1 washed						1.50@1.75					
No. 2 washed						1.25@1.35					
6x3-in. egg...		1.35				1.40@1.50					
Nut.....		1.30									
No. 1 nut.....	1.35@1.50		1.40@1.75								
No. 2 nut.....	1.25@1.40		1.35								
Screenings...	0.70@0.80	0.65@0.75	0.75@0.80	0.70@0.80	0.70@0.80						

INDIANAPOLIS

Colder weather and slightly increased factory operations have helped both the domestic and steam coal movement. Slack selling at about normal prices. Mines making better running time.

There has been a week of temperature below freezing which has stimulated the movement of domestic lump and there are also indications of industrial improvement, especially at Chicago. The colder weather has increased the consumption of steam grades about 10%. The mining companies have no trouble to dispose of their surplus screenings on the open market at 75c., which is about a normal price for December.

Operations at the mines are fair, one company working four of its mines on full time and the other three four days a week. Still the operators contend that the trade is dull in spite of the fact that all the mines in the state are probably making an average of four days a week. The railroad facilities are generally satisfactory, although some companies have

been a little short of hopper cars. Mine-run coal is still selling low, at \$1 to \$1.10 in the open market.

Retail prices continue unchanged from the mid-September schedule which is less than the usual winter level. There is apparently some disposition to force sales. One of the local companies had a bargain day, Monday, by offering 2000 tons of best Indiana lump at \$2.50, the general price being \$3.25. This undersold by 25c. a ton, the furniture installment house that is offering it to its customers and "friends."

ST. LOUIS

Colder weather has started some coal moving and the situation is slightly better. Screenings slowing up. Conditions expected to be quiet till after the first of the year.

There has been a slight improvement as a result of a few days of cold weather, the first this season. It did not last long enough, nor was it sufficiently severe to create a demand that would start domestic sizes upward, but it stimulated interest to such an extent that some coal began to move. It also stopped the advance in the screenings market. All sizes from No. 3 down are in good demand from all fields. The washed market is improved on the larger sizes, but otherwise conditions are much the same.

Anthracite is still slow. Winter weather is expected from now on, and this will help the market to assume a steadier tone. No great rush is anticipated before the first of the year, as the holiday season is always slow.

The prevailing wholesale prices are:

	Williamson and Franklin Co.	Big Muddy	Mt. Olive	Standard	Sparta
2-in. lump.....			\$1.25	\$0.95@1.10	\$1.20
3-in. lump.....			1.30@1.40		
6-in. lump.....	\$1.25@1.60		1.40@1.50	1.20@1.25	1.40
Lump and egg....	1.85@2.15	\$2.25			1.35
No. 1 nut.....	1.20@1.40			0.90@1.00	
Screenings.....	0.50@0.55			0.50@0.60	0.20
Mine-run.....	1.00@1.10			0.85@0.90	
No. 1 washed nut.	1.50@1.60	2.00	1.60		
No. 2 washed nut.	1.30@1.40		1.45		
No. 3 washed nut.	1.15@1.25				
No. 4 washed nut.	1.10@1.15				
No. 5 washed nut.	0.50@0.60				

KANSAS CITY

Colder weather has increased the consumption. Prospects that Jan. 1 will see prices advanced.

The first real winter weather of the season has appeared and the dealers are at last commencing to move the coal stocked in September. A slight scarcity of slack is noted, due to the increased consumption, combined with the small production of block coal and the consequent short supply of slack. Illinois coal is still off; many dealers have cars standing on track, but these will probably be moved under present winter conditions. Kansas and Missouri coals are rapidly stiffening up and salesmen have been notified to expect a change in prices at any time; Oct. 1 price lists are still in force.

SAN FRANCISCO

Foreign shipments being resumed now that the German fleet has been disposed of. Colder weather stimulating local business.

Shipping is now picking up, with the announcement of the annihilation of most of the remaining German squadron which has menaced shipments of coal to this country for several months. On several occasions they held up vessels and took off what coal they needed as was the case with the steamer "Sacramento," flying the American flag. Many of the South Sea Island towns were shelled and destroyed by this fleet. Several of the sea-fighters were in this harbor at various times to take on supplies, making use of the 24-hr. privilege.

Weather the past two weeks has been very cold and there has been an increased demand for domestic and steam coal. Dealers throughout the city are sanguine of steady business for several months to come. Quotations still remain normal, the latest quotations being \$6.50 for steam coal and \$7.50 for domestic.

Coal Contracts Pending

Contracts listed in this department are authoritative in every respect except where the source of information is questionable, in which event it is noted. All contracts are listed promptly on receipt and only repeated when additional information becomes available or in the last issue previous to the day on which bids will be closed. Liberal remuneration will be paid for all legitimate notices of this kind sent in.

Contract No. 22—Philadelphia—The date for receiving bids on this contract (pp. 933, 972) has been extended until Dec. 21. Address Director of Supplies, Room 312, City Hall, Philadelphia, Penn.

Contract No. 26—St. Louis, Mo.—Sealed proposals are requested at the United States Engineer's office for furnishing 30,000 tons of coal (see p. 972). All bids must be in by 11 a.m., Dec. 23, 1914. Address B. McD. Townsend, Colonel of Engineers, United States Engineer's Office, Custom House, St. Louis, Mo.

Contract No. 28—Brooklyn, N. Y.—Bids will be received by L. H. Pounds, president, Borough of Brooklyn, until 11 a.m., Dec. 23, for furnishing and delivering coal as follows: (1) 9,678,000 lb. of anthracite coal to the various public buildings, baths, courts and comfort stations, Borough of Brooklyn, under Schedule No. 1; (2) 8,586,000 lb. of anthracite coal to the various public buildings, etc., Borough of Brooklyn, under Schedule No. 2; (3) 3,692,000 lb. anthracite coal to the various public buildings, etc., Borough of Brooklyn, under Schedule No. 3. The security required will be 30% of the total bid, and the contract will run till Dec. 31, 1915. Blank forms and further information can be obtained at the office of the Bureau of Public Buildings and Offices, Room 1003, No. 50 Court St., Borough of Brooklyn.

Contract No. 29—Brooklyn—Bids will be received by the Department of Parks until 3 p.m., Dec. 23, for furnishing and delivering coal. The amount of security required will be 30% of the amount for which the contract is awarded, and deliveries will be made until June 30, 1915. Address, Department of Parks, Borough of Brooklyn, or the Department of Parks, Municipal Building, Borough of Manhattan.

Contract No. 30—New York—Bids will be received by the Park Board, Department of Parks, until 3 p.m., Dec. 23, for furnishing and delivering 2,000,000 lb. of anthracite pea coal, No. 1, for the botanical gardens, Borough of Bronx. The amount of security required will be 30% of the total amount for which the contract is awarded and will run over 120 calendar days. Blank forms and other information may be obtained at the office of the Department of Parks, Municipal Building, Manhattan.

Contract No. 31—New York—Bids will be received by the Department of Parks until 3 p.m., Dec. 21, for furnishing and delivering 600,000 lb. of egg coal, No. 1, for the parks in the Borough of Bronx. Deliveries will run over 120 days, and the amount of security required will be 30% of the total amount for which the contract is awarded. Blank forms and other information may be obtained at the office of the Department of Parks, Municipal Building, Manhattan.

Contract No. 32—New York—Sealed bids will be received by the Department of Water Supply, Borough of Manhattan, until 2 p.m., Dec. 21, for furnishing, delivering, storing and trimming coal in the Borough of Queens. The security required will be 30% of the total amount for which the contract is awarded, and deliveries are to be completed June 1, 1915. Address William Williams, commissioner, Department of Water Supply, Gas and Electricity, Room 2351, Municipal Building, Manhattan.

Contract No. 33—Yonkers, N. Y.—The Board of Public Works desires bids for supplying 300 gross tons of steam coal and 60 tons of nut coal, to be delivered at the bath houses; 250 tons of Scranton pea coal to the crematory; 250 tons of egg coal and 10 tons of steam coal to the City Hall Building. Address T. A. Brogan, City Clerk, City Hall Building, Yonkers, N. Y.

Contract No. 34—Newark, N. J.—The Board of Street and Water Commissioners is in the market for 800 gross tons of buckwheat coal. M. R. Sherrerd is Chief Engineer.

CONTRACTS LET

Contract No. 11—Portland, Maine—This contract, which provides for furnishing 30,000 tons of coal to the Portland Gas Light Co. between Mar. 1, 1915, and Mar. 1, 1916 (pp.

814, 854, 892), has been let to the Westmoreland Coal Co. Address Burton Smart, Treasurer, Portland Gas Light Co., Portland, Maine.

Contract No. 18—Brooklyn—This contract (pp. 972, 933, 854) has been awarded to the Bacon Coal Co., at \$2.24 per 1000 lb. Address Bureau of Public Buildings and Offices, Borough of Brooklyn, Room 1003, No. 50 Court St.

Contract No. 19—New York—This contract (pp. 972, 892) has been awarded to Gavin-Rowe, at \$63,447. Address Auditor, Room 2141, Municipal Building, Borough of Manhattan.

FOREIGN MARKETS

GREAT BRITAIN

Dec. 4—There is no improvement in the general state of the steam coal trade. Owing to the stormy weather, tonnage arrivals are few, and in consequence pit stoppages are more numerous. Buyers in a position to take immediate delivery can obtain substantial concessions, but there are few able to take advantage of the opportunity. For forward loading, values are upheld. Quotations are approximately as follows:

Best Welsh steam.....	\$4.80@5.28	Best Monmouthshires....	\$3.96@4.02
Best seconds.....	4.32@4.56	Seconds.....	3.78@3.84
Seconds.....	4.08@4.20	Best Cardiff smalls.....	2.52@2.64
Best dry coals.....	4.32@4.56	Cargo smalls.....	1.44@1.80

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both net, exclusive of wharfage and for cash payment.

Freights—Chartering is fairly active but tonnage is scarce. Rates are approximately as follows:

Gibraltar.....	\$3.00	Venice, Ancona... ..	\$4.92	Singapore.....	\$5.28
Malta.....	3.24	Alexandria.....	4.56	Las Palmas.....	2.76
Marseille.....	4.05	Port Said.....	4.80	St. Vincent.....	3.00
Algiers.....	4.28	Aden.....	5.04	Rio Janeiro.....	4.20
Genoa, Savona.....	3.90	Colombo.....	5.16	Monte Video.....	3.96
Naples.....	3.72	Sabang.....	5.04	River Plate.....	4.08

ITALY

Consolidation Co. has a large contract. Operators must arrange to quote c.i.f. prices.

Naples, Nov. 25—Large quantities of coal have been shipped during the past three months to Italy for use of the Italian Railway and Navy. The Consolidation Coal Co. has closed an important contract as it was able to offer the Italian Railways c.i.f. prices.

A very large business could be secured if American shippers were able to offer coals c.i.f. to the various Italian ports, and the quality naturally must be suitable as regards analysis, which should be as nearly as possible to the following: Volatile not to exceed 20%; sulphur, 1.10%; ash, 5%; moisture, 1%; calories, 7800 (Thomson).

GERMANY

Transportation facilities much deranged by military operations and a coal shortage is developing at some points. Situation particularly acute in Austria.

Upper Silesia—The demand is heavy, exceeding the supply, owing to the lack of cars, chiefly. Transportation to Vienna and the south has been broken, repeatedly. In 1913 over nine million tons of English coal were shipped to Germany, of which two and a half million tons went to ports on the Baltic. This coal was mostly for household use, and was consumed in the cities of northern Germany. How to meet this deficiency is, now, a matter of great concern.

Northwestern Bohemia—Although the pits have more orders than can be filled, the deficiencies in transportation are making it difficult to handle even the smaller production, which is but a little more than half the normal. The pits in Russian Poland which touch this district are in possession of Germany now, and are being operated under German administration.

Berlin—The shortage in household sizes is keenly felt. In 1913, Berlin consumed 1,654,466 metric tons of English coals. Although it would be easy to fill this tonnage from German mines under usual conditions, the problem has become a serious one with the reduced output from the pits, and worst of all, the car shortage. The military operations in the East have hindered the mines from shipping even the lessened production.

Vienna—The municipal authorities have had repeated conferences concerning the winter coal supply. The situation appears to be more acute here than at other centers. The shortage is due in a great measure to the small receipts from Upper Silesia.

Financial Department

The Rocky Mountain Fuel Co.

President D. W. Brown reports for the year ended June 30, 1914, as follows:

The number of tons of coal mined this year aggregated 924,000 tons. The coal handled on brokerage and through retail department aggregated 317,494 tons. The gross earnings were \$2,210,322 and the net earnings were \$328,743. The combined net earnings for last three years amounted to \$1,161,662, or a yearly average of \$387,221. The existing strike, although very serious, has not reduced net earnings to the extent generally expected. Normally there had existed a strike in the northern fields for a period of more than four years and the calling of strike in southern field on Sept. 23, 1913, had very little effect in the northern district, and your company was, therefore, able to procure the necessary men to produce a nearly normal tonnage.

INCOME ACCOUNT

Gross earnings, \$2,210,322; operating expenses, \$1,742,415; general expenses, \$139,164; balance, net earnings	\$328,743
Accrued interest, \$184,140; other items, \$63,075; total	247,215
Balance, surplus for year	\$81,528
Total accumulated surplus June 30, 1914, \$326,941.	

BALANCE SHEET JUNE 30, 1914

Assets—Property, equipment, etc.	\$12,195,615
Deferred obligations from subscribers for bonds and stock of company, \$702,992; less deferred payments on property acquired, \$700,000; balance Cash, \$59,263; accounts and notes receivable, \$661,577; total	720,840
Items paid in advance, \$12,719; material and supplies, \$121,693; total	134,412
Liabilities—Common stock, \$4,000,000; preferred stock, \$4,000,000; first and refunding bonds, \$3,948,400; total	11,948,400
Accounts and notes payable, \$619,340; pay checks and pay-roll items, \$56,480; total	675,820
Interest accrued, \$49,081; taxes and other items accrued, \$53,616; total	102,697
Surplus	326,941

Lehigh Valley Coal Co.

Vice-President and General Manager F. M. Chase reports for the fiscal year ended June 30, 1914, as follows:

Results—The total net income, after deducting charges for royalties, sinking funds, depreciation and interest, amounted to \$564,859, a decrease of \$906,415. This shrinkage is due almost entirely to the restricted demand for anthracite coal as a result of the mild winter. This not only reduced the profits by reason of the smaller volume of business done, but also added materially to the cost per ton of mining such coal as was shipped.

The production of anthracite coal from the lands owned and leased by the company, including that mined by tenants, was 7,877,390 gross tons, a decrease of 982,642 tons. The percentage of sizes above pea produced by our mining operations was 66.46%, a decrease of 2.22%. The Snow Shoe lands in Centre County, Penn., produced 252,731 gross tons of bituminous coal, a decrease of 97,373 tons.

Additions, Etc.—Additions and betterments cost \$344,785. The new breaker at Franklin colliery has been put in successful operation. Developments have been continued in order to place the Park colliery on a better operating basis; the unwatering of the old workings at the western end of the property, so that mining can be undertaken in that territory, is under way. Extensive renewals and improvements have been made to Centralia breaker. The new washery at Springdale for the purpose of reworking the culm banks on the Delano lands is now in operation. The shaft at Blackwood colliery has been sunk so that mining can be conducted on a lower level, and, upon the completion of the necessary tunnels and gangways, operating conditions at that colliery will be improved. At all collieries considerable sums have been expended to reduce the fire risks. Prospecting on the Snow Shoe property has demonstrated that there is sufficient coal in the lower or "A" vein to warrant the construction of a plant to mine same, and the necessary construction work is now under way.

Leases—The leases with the Girard Estate at the Packer and Continental collieries expired by limitation Dec. 31, 1913, but were renewed for a further period of 15 years at higher rates of royalty. As soon as the new leases were executed, the construction of a new steel fireproof breaker was undertaken at Packer No. 5 colliery and extensive alterations and betterments at Packer No. 4. Many important underground developments and mining improvements are also being prosecuted. These expenditures will place these operations on a most economical basis, as was necessary because of the high rates of royalty.

New Office Building—The general offices located in rented quarters in Wilkes-Barre have of late years been very inadequate. The company has, therefore, erected a modern office building, of fireproof construction, on North River St., Wilkes-Barre, with sufficient space for both present and future requirements.

Taxes—Our tax assessments have increased heavily in recent years. The taxes for the late year were about 25% greater than in 1912-13. This does not include the special state tax of 2½% of the value of the coal mined. The question of the constitutionality of the law imposing this tax is now before the courts for determination.

Financial—No new capital obligations have been issued and short-term notes given for the purchase of property in prior years have been reduced by \$100,000. Sinking fund payments amounted to \$111,136. Current assets are \$2,543,103 in excess of current liabilities.

PROFIT AND LOSS ACCOUNT FOR YEARS ENDING JUNE 30

	1913-14	1912-13	1911-12	1910-11
Total surplus beginning year ...	\$3,714,239	\$3,486,637	\$4,864,200	\$3,393,443
Net income for year	564,859	1,471,275	1,162,241	1,512,844
Improvements Jan. 1, 1909, to June 30, 1912, originally deducted from income		1,407,917		
Total	\$4,279,098	\$6,365,829	\$6,026,441	\$4,906,287
Deduct—				
Depreciation of improvements, Jan. 1, 1909, to June 30, 1912		\$2,566,240		
Appropriations for insurance fund		50,000		
Miscellaneous adjustments	\$53,413	35,349	\$10,924	\$42,087
Interest on certificates of indebtedness accrued prior to June 30, 1911			2,528,880	
Total	\$53,413	\$2,651,590	\$2,539,804	\$42,087
Total surplus end year	\$4,225,685	\$3,714,239	\$3,486,637	\$4,864,200

CONDENSED GENERAL BALANCE SHEET JUNE 30

	1914	1913
Assets		
Property and plant	\$24,580,588	\$23,700,498
Securities owned	200,000	200,000
Sinking fund with trustees	2,758,523	2,497,031
Advances for coal-mining rights	4,479,461	4,494,778
Insurance fund	122,189	110,547
Cash	2,302,051	1,801,270
Materials and supplies	323,054	424,102
Bills receivable	4,340	4,000
Due from individuals and companies	2,421,815	2,256,713
Insurance and other deferred assets	156,822	72,080
Total	\$37,348,843	\$35,561,019
Liabilities		
Capital stock	\$1,965,000	\$1,965,000
Funded debt	20,296,000	20,296,000
Audited vouchers	845,650	796,995
Wages due and unpaid	533,847	618,101
Due individuals and companies	22,392	42,244
Royalties on coal mined, due lessors	68,907	62,441
Interest on funded debt due and accrued	413,900	413,900
Deferred real estate payments	700,000	800,000
Miscellaneous	832,389	349,142
Depreciation and other reserve	7,445,073	6,502,966
Profit and loss	4,225,685	3,714,239
Total	\$37,348,843	\$35,561,019

Note—For previous annual report of this company see Vol. 4, p. 882.